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THE

JOURNAL OF BOTANY;

CONTAINING

FIGURES AND DESCRIPTIONS

OF

SUCH PLANTS AS RECOMMEND THEMSELVES BY THEIR NOVELTY,
RARITY, HISTORY, OR USES;

TOGETHER WITH

BOTANICAL NOTICES AND INFORMATION,

AND

OCCASIONAL PORTRAITS AND MEMOIRS OF EMINENT BOTANISTS;

BY

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JOURNAL OF BOTANY.

I.—Martius *on the Botany of Brazil.*

It is well known to our readers that the most accomplished of all Brazilian Botanists, Dr Von Martius, besides the valuable and splendid works of plates and descriptive matter which have already appeared, or are in course of preparation, has issued Fasciculi of *dried specimens* illustrative of the Flora of that extensive region, under the title of *Herbarium Floræ Brasiliensis.* The Introduction to the catalogue of plants in this herbarium contains so much valuable and interesting information, that we think we cannot do better than occupy some of the pages of our Journal with extracts from the original memoir which has appeared in a German periodical publication, too little known in this country, the *Flora oder Allgemeine Botanische Zeitung;* in the supplement of the 2d volume for the year 1837. We shall, probably, on a future occasion, publish also the list of the species contained in the herbarium, accompanied as it is by remarks which are of the greatest importance to the student of Brazilian Botany. —Ed.

Dr Martius commences his introductory observations by saying, that in publishing the first part of his Catalogue Raisonée of the plants of Brazil, he considers it necessary to offer some remarks:—1st. On the botanical collections that had been made, and the travels that had been performed by his predecessors. 2dly. On the geographical distribution of the vegetable forms; and 3dly. On the plan the author has himself pursued in determining the plants of Brazil, and in the formation of the herbarium of the Flora of Brazil.

1. *The Literary History of the Flora of Brazil.*

Four centuries have scarcely elapsed since Cabral (in 1500) discovered Brazil, and yet the amount of species of plants brought from thence to Europe is so great, as to be considered to exceed those of the entire Flora of Europe. Without any fear of exaggeration it may be fairly admitted, that the number cultivated in the gardens and preserved in the herbaria of Europe, exceeds 15,000. Dr Martius further estimates that this amount can only be reckoned a fourth part of all the species of plants that grow within the limits of the Brazilian territory, a country which, according to the lowest computation, measures 257,000 square leagues (of 20 to a degree,) and which includes, from the descent of the Serra Parimé to La Plata, and from the eastern declivity of the cis-Andes (vor Andes) to the Atlantic ocean, the most varied climates; notwithstanding that the mountains nowhere reach to the snow-line. It is the extent and importance of such a Flora which led to the undertaking of this "Herbarium Floræ Brasiliensis;" seeing that the idea of writing a satisfactory Flora of such a country could not be accomplished by one individual;—and still more futile would it be to attempt a completely illustrated work of the multiplied forms of the vegetable kingdom there, even though confined to such as are already known to Europeans. But when a considerable number of species of plants, from the different provinces of the empire, are faithfully designated and deposited both in public and private Museums, the knowledge of the particular species is perpetuated in an easy and certain manner. How the mass of materials towards such an object has increased to its present extent, by the industry of naturalists who have laboured in the Brazils, we shall now proceed to show.

The first authors who have made particular mention of Brazilian plants, are—1. Thevet, "Singularités de la France antarctique." Paris, 1554. 2. Levy, "Historia Navigationis in Brasiliam." Paris, 1585. 3. "Abbeville, Histoire de la Mission de P. P. Capucins en l' isle de Maragnon." Paris, 1614. 4. The unknown author (probably Francisco da Cunha) of the "Noticias do Brazil," who wrote in Bahia in 1589, and sent his MSS. to the minister Don Christovam da Moura; but which was not printed till 1825, and then by the Royal Academy of Science at Lisbon, in their "Noticias para a Historia geografia das Naçoes ultramarinas," Tom III.—5. Jos de Anchieta, "Epistola quam plurimarum rerum naturalium, quæ S. Vincentii (nunc S. Pauli) Provinciam incolunt sistens descriptionem, a Didaco de Toledo Lara Ordonhez,* &c. &c., Olisip," 1799. The merits of these works are not discussed by Dr Martius. They are considered as the counterpart to the works of Petrus Martyr, Oviedo, Gomara, Acosta, P. de Cieça and others, who, in the olden time, described the plants of the Antilles, and others of the Spanish colonies. They all notice the common American useful and medical plants, agreeably to the low state of the sciences at that time. They are therefore of the greatest interest to the historical inquirer into the native country of particular vegetables, the mode of cultivation and application to various purposes, and the nomenclature of the aborigines. On this account they merit greater attention than one is accustomed to pay to them, while, on the other hand, to the mere systematic botanist they are of subordinate value.

The literature of a Natural History (in the stricter sense of the words,) of Brazilian Botany, may be said to have commenced with Piso and Marcgrav. Most of the species that are introduced in the very valuable work of these Patres Floræ Brasiliensis, (G. Piso, Historia naturalis Brasiliæ. Amstel, 1648,) were, for that time, described with great clearness; and in point of fidelity and solid information, it surpasses the similar work of Hernandez on the Natural History of Mexico: and it is to be wished it were quoted with more regard to the various editions than is usually done. Besides the wood-cuts which illustrate the work itself, there exist, as is known, in Germany, the original drawings by

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* The old edition of this worthy converter of the Heathens and of Thammaburg Anchieta, who was known to be active in the year 1554 in the province of St Vincent, is one of the rarest of the literary productions on Brazil.

Marcgrav and Fr. Post. They are preserved in the Royal Library at Berlin, under the title of "Liber Principis;" and through the kindness of Messrs Ehrenberg and Von Schlechtendal, Dr Martius is in possession of copies which have materially assisted him in determining some few, yet apocryphal, species of plants.

2. Upon the expulsion of the Dutch from Pernambuco, Bahia and Cearà, the whole country returned again under the dominion of Portugal, and the ignorance of this people regarding its Natural History was so deplorable, that the learned Padre Vieira, one of the greatest pulpit orators of the Portuguese nation, and no mean classical writer, declared his opinion that all the spices of the East Indies grew wild, or were naturalized in the Brazils. A century now elapsed before the smallest knowledge of the Flora of the country was obtained. The first who deserved any merit on this account, was Dominicus Vandelli of Padua, who was called, by the intellectual and powerful minister Pombal, to Coimbra, and afterwards to Lisbon, there to teach chemistry and botany. Many of his pupils sent him plants from Brazil, which were partly published by himself, (some were received by Linnæus), and they were deposited in the Natural History Cabinet at Lisbon, till, after the attack of the French troops under Junot, they were carried off and placed in the Jardin des Plantes at Paris. The most active correspondent of Vandelli was, his pupil Vellozo, born at Minas, a Jesuit, and probably the same who is called by Vandelli, Dr Joaquim Velloso de Miranda. From him were received according to the authority of Senr. Joam Gomez, (Director of the Garden at Rio de Janeiro), most of the species of plants from the provinces of Rio de Janeiro and Minas, which Vandelli published in a very indifferent manner in his "*Fasciculus** *Plantarum cum novis Generibus et Speciebus,*"

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* This "*Fasciculus*" appeared at Lisbon, in 4to, in 1774; and his "specimen" in a "*Diccionario dos Termos technicos de Historia Naturel, &c. Coimbra,* 1788," and also in another separate form. It is exceedingly rare. Dr Martius saw it only once in Brazil. Both are known to

and in his "*Floræ Lusitanicæ et Brasiliensis Specimen.*" Other species of the Province of Pará, Vandelli received from the physician of the governor of the Estado de Pará, Don Mendoza Furtado, the brother of Pombal, and from Dr Brandam, the vicar-general of Pará. The exertions of Vellozo were far more productive than those even of his teacher. During a residence of several years in the house of a priest at Mariana, he collected and described a great part of the plants that presented themselves to his researches in the fertile and hilly environs of that town. His manuscripts found their way to many of his scholars at Villa Rica, some are now in Dr Martius' possession, and Dr Gomides of Mariana employed others of them in the compilation of his work on officinal plants of Minas, (July, 1814.) Colonel Joam. Gomez da Silveira Mendonça, afterwards director of the powder manufactory, and subsequently Minister of Marine, was one of his pupils.

When Vellozo returned to the capital, he occupied himself especially with the Flora of the environs of Rio de Janeiro, and towards the end of the last century and during the beginning of the present one, he prepared a large collection of drawings, which were preserved in the public library at Rio, and which now (too late not to be greatly behind the present state of the rapidly progressing science), have been lithographed and published. Hence has originated the "*Flora Fluminensis,*" a strange publication, which may be held up as an example of an ill-advised literary undertaking, and on so great a scale that it ought never to have been commenced. Eleven huge folio volumes with about fifteen hundred* plates constitute this bulky work, whose usefulness is, alas! not in proportion to the expense it occasioned. Very many genera that are here introduced as new, are not so, but known before; others, with old names, are either new or

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have been republished in Römer's "*Scriptores de Plantis Hispanicis, Lusitanicis, Brasiliensibus.*" Nuremb. 1797.

* The Editor of the Index says 1640.

old species and old genera inaccurately detailed. The genus adopted is often extended beyond all bounds; thus for example, as species of *Mimosa*, not only *Mimosæ* and *Acaciæ* occur, but also *Swartzia*. The pompous title of this book runs thus: "Petro nomine ac imperio primo Brasiliensis Imperii perpetuo defensore imo fundatore scientiarum artium litterarumque patrono et cultore jubente Floræ Fluminensis Icones nunc primo eduntur. Edidit Dom. Frat. Antonius da Arrabida, Episcopus de Anemuria, Cæsareæ Majestatis a Consiliis, nec non Confessor, Cappelani maximi Coadjutor, studiorum Principum ex imp. stirpe Moderator et imper. publicæque Bibliothecæ in urbe Fluminensi Præfectus. Paris ex offic. lithogr. Senefelder, curante E. Knecht. 1827."

(This is really a literary curiosity, and is not unknown to many of our botanists in Britain, who have been tempted to purchase it; often, if my memory does not fail me, for a sum in Paris scarcely exceeding £3 sterling, an amount which is trebled and quadrupled by the duty and binding. The following is a brief historical notice of this work given by Von Martius in a note, and many of the particulars we have heard verified through other channels.—ED.)

Vellozo had undertaken the preparation of this work with but little literary aid, and he had annexed to his drawings short characters of the genus and species. It was not then his intention that it should be published in this state. But when Don Pedro, in 1824, saw the first number of Dr Martius' "*Nova Genera et Species*," he exclaimed, "is it so, that foreigners must come in order to describe our plants; cannot we do this ourselves?" He then took the advice of his father confessor, and it was determined that the whole of the drawings that Vellozo had left should be lithographed in Paris, and the text for it printed in Rio de Janeiro. The Brazilian Embassy was hence charged to make a contract with Senefelder for the lithographing and printing* a thousand copies, and it was commenced with all becoming ardour; but the whole contract was not completed when those events occurred which drove Don Pedro from his throne. The money consequently failed, and as the person who was commissioned to supply the paper was not remunerated, he seized the work, of which a great number of impressions was sold as waste paper and actually served for making cartridges, and employed in the war of the French in Algiers! The rest came into the market, and, as may be believed, were offered to the trade at very low prices, perhaps for little more, or even less than the value of the paper.* The text, it was

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* The Editor of the "*Index Iconorum Floræ Fluminensis*," which has since been published in Paris, gives, and we should think upon good autho-

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rity, a different and more extravagant statement. "Les agents du gouvernement Brésilien acceptèrent les propositions de M. Knecht successeur de Senefelder. Ils fixèrent le nombre d'épreuves à tirer du chaque plante à 3,000 ; et, malgré les representations de plusieurs personnes compétentes, et de l'imprimeur lui-même, sur l'inutilité d'un si grand tirage, le gouvernement du Brésil persista dans le chiffre qu 'il avait ordonné. Ainsi cinq millions et demi (1,640 plates were executed at Paris according to this author) d' épreuves devaient être executées dans l'espace de huit années, avec reserve de la part de M. Knecht de les fournir à une époque plus rapprochée, s'il le jugeait convenable. En vertû de cette convention, l'ouvrage a été terminé en quatre années et quatre mois, et les dernières livraisons étaient déja sous presse lorsque l'ordre de suspendre le tirage arriva; circonstance qui fut provoquée par les événements qui amenèrent l'abdication de Don Pédro. Les chambres du Brésil avaient constamment désapprouvé une entreprise aussi colossale et aussi coûteuse ; mais il était trop tard pour refuser les deux dernières livraisons qui devaient compléter l'ouvrage, composé en totalité de soixante livraisons; de telle sorte que les 1,640 gravures étaient entièrement achevées à Paris, quand l'impression du texte n' etait arrivée q'au tiers à Rio de Janeiro."

* To complete the history of this magnificent abortion, which would probably soon have sunk into oblivion, but for the flattering representations made of it by more than one distinguished individual, who might be considered competent judges, and for the fact that De Candolle and other eminent scientific men have thought the plates worthy of being quoted, we shall give a translation of the "Prospectus," which appeared with the number.

"It is with the highest satisfaction that we announce to the scientific world the appearance of the greater portion of the botanical works of our countryman the Reverend Brother Joseph Marianno da Conceiao Villozo, a Franciscan of the province of Rio Janeiro, and native of Minas Geraes, intended should appear in Brazil, in numbers accompanying every ten plates, but none appeared except with the first number. The same evil star seems to have attended this great undertaking (which has cost the Imperial Brazilian

This work, entitled '*Flora Fluminensis*,' contains descriptions of 1639 species of plants.

"This valuable manuscript, the fruit of much labour, science and precision, is complete as regards the plates, but some deficiencies exist in a few of the latter descriptions. This slight omission will, however, be little felt in an age when this department of Natural History has attained such perfection.

"The author dedicated it in 1790, to Louis de Vasconcellos, since created Count de Figueiro, his patron. The work obtained him the honour of being summoned to the court of Lisbon, where he enjoyed not only the notice and esteem of all amateurs of Natural History, but also of the learned and noble individuals who acknowledged his distinguished merit. Government testified its confidence in his talents, by intrusting to him several scientific works of different kinds, and he was, moreover, selected to establish and direct a school of chalcography and literature, whose happy results were highly beneficial to science and the arts, while they proved at the same time, his learning, industry and zeal.

"The Reverend Jos. Marianus Vellozo, inspired by the force and energy which genius communicates, developed his talents in the execution of this work, an undertaking the more meritorious when we consider his advanced age; for the greater part of his life had been spent in the strictest observance of his religious duties, his residence in a country subjected to the severity of colonial legislation, and his situation, which was isolated and almost indigent, though abounding in those riches of nature's productions, which he alone knew how to appreciate, and which are so lavishly scattered over this part of the world.

"Addressing his descriptions to the learned, our author preferred writing in the Latin language, and we must do him the justice to confess, that he is almost always happy in the choice of his expressions, which are eminently sonorous and harmonious; those names of ancient or modern *sçavans* being selected, which are of agreeable sound and easy to be retained in the memory, thus avoiding a fault into which many of the most eminent writers in this line have fallen. Nor did he neglect the great advantage of perpetuating such names of plants as are used among the original inhabitants of the country, because they mostly convey to the mind that kind of utility which they may possess. To crown the result of his painful researches, Vellozo had the advantage of finding in the recesses of his cloister, and among his brethren, some skilful draughtsmen, whose excellent delineations leave nothing to be desired in the original designs from which these beautiful plates, long the admiration of connoisseurs, have been copied.

government above a million of francs) that has always accompanied the Spanish and Portuguese governments in publishing the Floras of their other colonies. The "*Flora Peruviano-Chilensis*," by Ruiz and Pavon, one half of which has

"Still, though possessing such valuable claims on the esteem of the learned, this work remained for a number of years, buried under the dust of the imperial library shelves, neglected, unknown, and lost to the honour of Brazilian talent. As soon, however, as by a fortunate accident, the existence and merits of the manuscript were made known to Don Pedro I., his majesty, as founder of the Brazilian Empire, and patron of the talents of his subjects, commanded that the text should be immediately consigned for printing to the national press, and that the designs should be transmitted to Paris, there, and also at the expense of government, to be engraved by M. Knecht, the successor and worthy pupil of M. Senefelder, who invented the art of lithography. By this arrangement, these designs now appear in the greatest perfection, printed on fine vellum paper. A few copies of still larger size were taken off, for preservation in the libraries of the curious.

"Doubtless, among the learned admirers of this work, there will be some who would have preferred that the *Flora Fluminensis* were completed, by the addition not only of the new discoveries that twelve years have witnessed through the investigations of celebrated European travellers in Brazil, but also by filling up the gaps which exist in some portions of the text, and thus harmonizing it with the perfection of the plates, and rendering the book, as they may judge, more worthy of this enlightened age. But who does not feel, that with so many changes, the *Flora Fluminensis* would be no longer the work of Vellozo, an author already most advantageously known, as having produced an infinity of printed and translated publications? And would it not be an insult to his fame, thus to bolster it up by foreign means? Assuredly, we ought to respect a production, whose materials have been collected, described and classified, with so much discernment, perfection and labour—written in the year 1790;—a work which the munificence of his Imperial Majesty has caused to be printed as a monument of Brazilian talent, indicative of that elevation which the genius of the nation, so eminently to the arts and sciences, can attain, and which will never fail of meeting with encouragement from his Imperial bounty.

"Finally, that we may gratify our national *amour propre* consistently with perfect delicacy, we frankly own that this production of our countryman is neither complete as a botanical work, nor a perfect instance: it is neither more nor less than the work of Vellozo, transmitted through imperial munificence to posterity,—such as the author left it, in its beauties and in its faults. Can the sublime effusions of a Linnæus, a Tournefort, or a Bufalone been published, and the results of the grand expedition of the celebrated Mutis lie buried in the chests of the Botanic Garden of Madrid.

The next author on the Flora of Brazil mentioned by

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fon, be pronounced free from imperfection,—nay, from error? If the natural sciences themselves are still far from attaining perfection, this is not because the human mind has continued stagnant and inactive; for, on the contrary, it has lately honoured itself by prodigious discoveries, especially made during the past century. But, for this very reason, it becomes more and more interesting and honourable to compare what is ancient with what is modern, and to render justice to merit wherever it may be found. We feel certain, that all learned men, all friends to science, whether natives of this country or foreigners, will applaud this enterprise, and, while acknowledging the interest that it inspires, will join with the zealous partisans of the national honour and glory to promote its success. In a word, that we may not be taxed with partiality, we will finish this slight sketch of our author's work, by adducing the opinions of those eminent individuals, who were permitted to see and consult it, either in the Imperial Library at Paris; among others, his excellency Viscount de St Leopold, M. M. Spix, Martius, Aubert du Petit Thouars, St Hilaire, &c., and here quoting what they wrote respecting it. The former, in his annals of the Province of St Peter, when speaking of the celebrated plant *Maté,* says, 'M. de St Hilaire has communicated to me a description of it,' adding, that he 'had seen a very correct drawing of the plant in the *Flora Fluminensis* of Vellozo, (where it was, however, improperly named *Chomelia amara,*) the production of a man of great merit, who, unprepared by preliminary study, and impelled solely by his own genius, has undertaken and executed several long and difficult botanical excursions. May the *Flora Fluminensis* no longer continue unpublished and overlooked in the library at Rio Janeiro! Such are my wishes, prompted alike by a desire for the promotion of science, and for an act of justice towards the memory of one who is the ornament of his country, and a credit to the religious order, of whose rule he ever proved himself a strict observer.'

"The wishes of this zealous citizen and estimable writer are now accomplished. M. de St Hilaire expressed the same desire in a note of his book entitled *History of the most remarkable Plants of Brazil and Paraguay,* when he says, 'Vellozo is the author of *Flora Fluminensis,* a work now existing in mst. at Rio Janeiro, and of which it is much to be desired that the magnificent drawings could be published.' It is our privilege, at the present day, to congratulate this eminent writer on the fulfilment of his wishes.

"Finally, an individual, celebrated alike in arms and literature, as well as by the numerous researches that he made to discover the traces of the intrepid and unfortunate La Pérouse,—we allude to M. Aubert du Petit

Von Martius was a native of Pernambuco, Manuel Arruda da Camara. He was a disciple of Gouan at Montpellier, and undertook to introduce into Brazil a more rational mode of cultivating the Cotton, and employed his pen on the subject, (printed at Lisbon, 1799), as well as in composing a Flora of Pernambuco, a tract of country which had not been visited by any botanist since the days of Piso and Marcgrav. His draughtsman was one Martius Ribeiro, who afterwards, in the year 1816, was one of the ringleaders of the revolution of Pernambuco, and paid the forfeit of his crimes upon the gallows. The drawings for this Flora ("*Cent. Plant. Pernamb.*" *MS.*) is at present in the hands of the brother of the author, Francisco Arruda da Camara. Manuel further published at Rio in 1810, a Discourse on the utility of forming Public Gardens in the principal Provinces of Brazil, and on the substitutes for Hemp and Flax which may be found in Brazil, and for which the fibres of *Urena sinuata* have been strongly recommended. Both their Treatises appeared in Koster's Travels in Brazil.

Dr Alexandre Rodriguez Ferreira was doubtless one of the most learned and zealous men of the Portuguese nation, that has travelled in and investigated the Brazils; and he has done more for Botany than almost any individual, but it was not

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Thouars, who thus expresses himself in a letter, addressed to the lithographer, M. Knecht. 'I have just glanced at the original drawings and their copies on stone which you have kindly transmitted to me. The broad and simple style of the designs is well adapted to give the general outline of the plants, and resembles that of *Phunico,* combined with more detail and correctness in the parts of the inflorescence. As to your copies, they appear to me as accurate as is possible, perfect *fac similes,* which give the happiest augury for the execution of the rest of the collection. The examination of these plates has led me to think that I might advantageously employ your style of engraving for the benefit of science, and to hasten the publication of my works which have already been too much retarded.'

"It is needless to say more either in favour of the original work, or of the execution of the present work; indeed, we may candidly confess, that the hopes which our patriotism entertained are even more than fulfilled—they are surpassed by the performance."

his fortune to become an author; and his memory continues to live only with the aged Brazilians, who have never ceased to praise his zeal and activity; or at Lisbon, where his collections are deposited. Ferreira was born at Bahia, on the 27th of April, 1756, and having studied at Coimbra, he was despatched in 1783, by the active Colonel and Minister of Marine, Martin de Millo e Castre, in pursuit of Natural History, and with a view to form collections in the provinces of Para, Rio Negro, and Mato Grosso. He was accompanied by two draughtsmen, Joaquim José do Cabo, and José Joaquim Freire, as also by a botanical gardener, Agostinho Joaquim do Cabo. In October, 1783, Ferreira arrived at Para, where, and at the island of Marajo, he spent twelvemonths. The following year he went in company of the Governor of Para, Martin de Sousa e Albuquerque, up the Amazon River, and then visited the Rio Negro and Rio Branco, to the north-western boundaries of Brazil. In August, 1788, he sailed up the Madeira River, and after a very troublesome journey of thirteen months, he arrived at Villa Bella, the capital of the Province of Mato Grosso. He arrived at the Villa de Cujaba, in June, 1790, and returned to Para in 1793. Here he shipped his collections, made during these almost ten years of travel, in Zoology, Botany, Mineralogy, and all his curiosities connected with the Indians, for Lisbon, where he was appointed Director of the Museum of Natural History, and of the Botanic Garden. Of equal importance with these collections, were his journals and manuscripts, full of solid information and accurate descriptions and remarks, but which for reasons unknown to the world, were never published; a circumstance which plunged this active-minded man into a state of deep melancholy. After his death in 1815, his MSS. came into the possession of Don Felix Avellar Brotero, an anxious, dilatory, and jealous man, who made no use whatever of them.

At the same school of Coimbra, was educated Joam da Silva Freijo. By command of his government, he undertook first a voyage to the Cape de Verd islands, and afterwards he resided several years in the Capitania of Ciara. The official account of the Natural History and Geography of this Captaincy (Rio, 1815) affords no important results especially in Botany. Freijo served the state for a long time as Director of the Cabinet of Natural History at Rio de Janeiro.

Although three men of public spirit and great influence endeavoured, during the early part of the present century, to elevate the standard of Botany in Portugal and Brazil to a higher scale, yet their efforts were not crowned with any particular success. The first of these was Jose Correa da Serra, a Botanist, as his beautiful carpological works and his treatise on the *Aurantiaceæ* abundantly prove. As secretary of the Royal Academy of Sciences at Lisbon, which he established through the influence of the Duke of Lafoens, he was actively engaged in correspondence with the Naturalists and men of science in Brazil, and thereby enriched the Museum of the Academy. The other two promoters of Botany were the minister of state, Don Rodriguez de Souza Continho, Conde de Linhares, and Ant. de Arauja de Conde da Barca. The first established a Botanic Garden at Para, where he for a long time resided as Governor, and where he especially wished to introduce the equatorial plants. Afterwards, when removed to Rio de Janeiro, as Minister of the Interior, he strove to improve the mode of instruction at the schools in the branches of Natural History; he placed Professors in the schools of Medicine, and endowed the Cabinet of Natural History. Arauja himself was a cultivator, and he had in his private garden about 1400 species of plants, of which he made a Catalogue. To him the country is indebted for the formation, and afterwards the enlargement of the noble Botanic Garden at Rio (Jardin Botanico de Alagoa de Treilos) destined to receive all the useful plants of the tropics, and where the Tea Plant is cultivated by Chinese whom he introduced to the country. Notwithstanding this friendly encouragement, the science of Botany did not take deep root; and if at any time among the younger physicians of talent, any one devoted more than ordinary attention to this pursuit, he was soon turned aside from it by the prospect of greater gain on his exertions taking a different direction.

A few Botanists only now need be mentioned, who exclusively belong to the present century. The first place among them on account of his zeal, his activity, and the universality of his knowledge, belongs to Bernardino Antonio Gomez, an eminent physician, and the discoverer of what his countrymen for a long time denied, a *Cinchona*. He has in the Memoirs of the Lisbon Academy, (in 1812,) described many interesting plants of the Brazils (with some figures) which he collected during his residence at Rio de Janeiro.

After him may be mentioned Manoel Joachim Henriquez de Paiva, (nephew of Dr Sanches, who was in correspondence with Linnæus,) who has the greatest merit as connected with the Flora of Brazil. He described plants of Brazil in his *Memorias de Historia Natural*, for example several officinal Dorstenias.

Frey Leandro do Sacramento, of the order of Carmelites, a learned and industrious man, who received his early education at his native city Olinda, (Pernambuco,) and then at Coimbra, from the instructions of Bertero. He was afterwards called to be Professor in the recently organized medical school at Rio, by the minister Araujo Conde de Barca. As well as the weak state of his health would allow him, he employed himself in collecting and describing the plants there. His attention was particularly attracted by the numerous *Euphorbiaceæ* about Rio, and he had in view to publish a Monograph of them, but which his increasing illness prevented. He sent some small collections of dried plants to the Muséum d' Histoire Naturelle at Paris, and to the Royal Academy of Sciences at Munich. A Treatise, written in Latin, on some of the plants observed by him, which was also sent to the Bavarian Academy, is, with some observations of M. von Schrank, printed in their Transactions, (for the years 1818—20.) The Genera quoted as new, are *Langs-*

dorffia = *Xanthoxylum*; *Spixia* = *Pera* or *Peridium*; *Martia*; *Augusta* = *Stiftia*; *Raddisia* = *Salacia?* [With few exceptions, what more is published on the plants of Brazil, has reference rather to the uses and advantages to be derived from them by mankind, than to descriptive or systematic Botany. We shall therefore pass that over in silence, and quote from Martius what foreigners have done to promote a more correct knowledge of Brazilian vegetation.]

As the southern parts of the Brazils, but particularly that of Rio de Janeiro, afford excellent harbours and many advantages to those who circumnavigate the globe, they have been frequently visited since the time of Magelhaen, and on these occasions their plants have been collected by the Naturalists of the several expeditions. Cook, on his first voyage round the world, in 1768, touched at the noble port of Rio, where Banks and Solander botanized. Many interesting plants that were discovered by these celebrated men were only published after a lapse of seventy years: for example, *Oxypetalum Banksii*, and *Alsodeia physophora*. In the year 1766, Bougainville touched there, and his companion Commerson commemorated the name of the commander of the expedition in the beautiful *Bougainvillea spectabilis*, which he gathered in the hedges of the suburbs. Macartney visited Rio on his voyage to China, in 1792, where his young companion, Sir George Staunton, detected many valuable species of plants.

The Russian navigator, Krusenstern, in 1803, and Kotzebue, in 1815, the first accompanied by Langsdorff and Tilesius, the latter by Chamisso, landed on the fertile island of St Catharine; and to M. Langsdorff we are indebted for the first charming description of the magnificence of Brazilian vegetation. These have greatly contributed to direct the attention of European naturalists to the tropical regions which were before almost unknown. The Brazilian plants which were found in these two Russian expeditions are particularly described in the following works:—"Plantes recueillies pendant le voyage des Russes autour du Monde, Prem. partie; Icones Filicum (auct, *Fischer* et *Langsdorff*; Stuttg. 1810."

Enumeratio Filicum, quas in itinere circa terram legit Adalb. de Chamisso, auct. *T. F. Kaulfuss,* Lips, 1824, and particularly in a valuable series of treatises by Messrs Chamisso and Schlechtendal in the Linnæa, under the title, "De Plantis in expeditione speculatoria Romanzoffiana collectis."

Freycinet in his "Voyages autour du Monde, 1817–1820," gives, in the botanical portion of Gaudichaud, Paris, 1825, many plants collected at Rio de Janeiro. The second French expedition of Duperrey (1822–1824,) by the botanical labours of D'Urville, Brongniart and Bory de St Vincent (Paris, 1828, &c.) has enriched the Flora of Brazil with plants that have been gathered at St Catharine. Other French Naturalists, as Gay and Leschenault, landed also at Rio de Janeiro, and sent their collections to the Herbarium of the Museum in the Jardin des Plantes. M. Gaudichaud also enriched this Museum with some thousand specimens of plants which had been procured by various Brazilian collectors, and placed in the public Cabinet at Rio de Janeiro. O. Von Kotzebue also visited Rio again during his voyage round the World, in the years 1823–1826. Professor William Jamieson (now of the University of Quito,) collected Mosses, which have been described by Dr Arnott.

It must, nevertheless, be confessed, that it is not by hasty visits of Naturalists that the general Flora of the country could be made known to us, but by those Europeans, who have penetrated into the interior, and who had so long been excluded from it. The first who thus collected plants in Brazil, was a German, Mr Sieber. Para, at that time, under the presidency of the enlightened Conde dos Arcos, enjoyed a happy peace. Count von Hoffmanseg, so well known by his travels in Portugal, and his illustrated Flora of that country, sent his servant Sieber to Brazil, in order to collect insects, and he brought to his patron a considerable collection of dried plants, some gathered in the environs of Para, others in Cameta, along the banks of the Tocantins. Many of these were given by Count Hoffmanseg to Willdenow for his Species Plantarum. But the collection was described by him, and the manuscript under the title of *Flora Paraensis*, and both one and the other given to Dr Von Martius for insertion in the general Flora of Brazil.

After the removal of the Court from Lisbon to Rio de Janeiro, the Brazils were emancipated. Its ports were opened to travellers of every country, and several European Courts sent diplomatic representatives to the capital of this now independent country. M. Von Langsdorff took up his residence in Rio de Janeiro as an Imperial Consul-general, and, attracted by the beauty of the vegetation, he directed his energies to the collecting of the copious productions of the district of Rio, particularly those of the Organ Mountains, where he possessed the beautiful Fazenda Mandiocca, and also a tract of the coast at Cabo Frio. He placed his collections with great liberality in the public Museums of Paris, Munich, and St Petersburg, and in several private herbaria. During the first years he had, as an assistant, Mr G. W. Freyreiss of Frankfort, who afterwards entered into the service of his Highness Prince Max. v. Neuwied, whom he accompanied, in 1816, and 1817, on his travels from Rio along the coast to Bahia. At the expense of the Swedish Consul, M. Westin, Freyreiss also made collections for the herbaria of Upsal and Stockholm, and in two dissertations, written under the Presidency of Thunberg by Billberg and Ahlberg, (Upsal 1817 and 1818) are described twenty species of Freyreiss' collections. After he had undertaken a journey to Minas Geraës, he went with his countryman, Mr Sauerlander, to Ilheos, from whence both of them sent collections of Natural History to the Senkenberg Institute of their native city.

Mr Fr. Sellow of Potsdam, was the first European Naturalist who came to the Brazils purely with the view to obtain its vegetable treasures. Aided by Sir Joseph Banks and Mr Aylmer Bourke Lambert, he came to Rio de Janeiro, and at first employed himself with the Flora of the environs of that city, and then engaged himself at the same time with Mr Freyreiss to the Prince de Neuwied. Through the influence of the minister, Araujo, he was afterwards appointed Brazilian Naturalist, with a moderate salary. He accompanied M. Von Olfers, in 1819, on a journey through the provinces of Minas Geraës and S. Paulo, and afterwards in the southern provinces of St Catharine, S. Pedro do sul, or Rio Grande, and Monte Video, which he traversed in all directions, and of which country he investigated not only the Botany, but the Geology. The extensive and well prepared collections that he sent to the Royal Museum at Berlin, prove his great diligence as well as talents; and it is painful to relate, that after all his laudable exertions, he was not able to return to his native country, but perished in Rio Doce, some say while bathing, others by assassination.

No botanist, who has trodden the soil of Brazil, has ever so thoroughly examined the country, and in such various directions as Sellow, and it were most desirable for the interests of science, that the papers which are in the hands of his friend and fellow-traveller, M. Von Olfers, should be communicated to the scientific world. Many of his discoveries have been published by Professor Link, in the *Hortus Berolinensis*, (1821, 1827, 1833,) and by Chamisso and Schlechtendal in the Linnæa. Sprengel also has described many of them in his *Neuen Endeckungen*, 1820, and in his edition of the *Systema Vegetabilium;* and Mr Lessing, numerous Compositæ in the *Linnæa*, and in the *Synopsis Generum Compositarum*, as M. De Candolle has also in the fifth (and following) volumes of the *Prodromus Syst. Veget.;* but a still greater number remain. Indeed the herbarium left by this indefatigable but unfortunate botanist and traveller, amounts to 10,000 species! and by his will, the first specimen of every species is to be deposited in the Royal Berlin Herbarium; the second in that of M. Von Olfers, and the third, in M. Kunth's.

Another Naturalist, whose exertions for the Flora of Brazil have secured him an immortal name, is M. Aug. de St Hilaire. He left France for Rio in 1816, in the suite of the Ambassador, the duke of Luxemburg, and returned in 1822. The collection is estimated at 7000 species. His first journey was partly in company with M. Von Langsdorff, to the mining districts, over which he travelled for a period of sixteen months. A second, was from Rio to the province of Espiritu Santo, and the Rio Doce. A third, of greater extent, was over S. Joam del Rey, and the Serra Negra to Paracatu, in the western district of the province of Minas; then to the Villa Boa, the capital of Goyaz, and to the Rio Claro. From thence the traveller returned through the open Campos of St Paulo, and into the south to Curitiba and Porto Alegro. A year was almost wholly devoted in going hence and travelling over the Missions of Paraguay and the Banda Orientale, whence he took ship with his collections for Rio. Great and various are the results of these journeys, and there is nothing to be wished but that St Hilaire's health may allow of his completing the publication of his labours. The following are the memoirs in which M. de St Hilaire has inserted his numerous descriptions of plants and his important geographical remarks, and those on medical, œconomical, and technical botany: "*Flora Brasiliæ Meridionalis,*" 2 vols. and 3 Fasciculi, Paris, 1825-1832. From the twentieth Fasciculus M. de St Hilaire has enjoyed the able assistance of M. Adrien de Jussieu, and Cambessedes.—2. "*Histoire des Plantes les plus remarquables du Brésil et du Paraguay,*" vol. 1. Paris, 1824.—3. "*Plantes Usuelles des Brésiliens,*" Paris, 1824.—4. "*Voyage dans les Provinces de Rio de Janeiro et de Minas Geraes,*" vol. 1, 2. Paris, 1830-8.—5. "*Voyage dans le district des diamans et sur le littoral du Brésil,*" vol. 1, 2. Paris, 1833-8.—6. "*Tableau de la Vegetation primitive dans la Province de Minas Geraes,*" in the Annales des Sciences Natur. vol. 24. *p.* 64. &c.—7. A brief account of their journey is also given in the "*Bulletins de la Societé Philomatique,*" 1823-1826.—The plants of M. de St Hilaire will be found as far as they have been described in the general herbarium of the Jardin des Plantes at Paris.

Nearly at the same time with M. de St Hilaire, his Highness Prince Maximilian Von Neuweid visited Rio, and afterwards published his travels; in the appendix to which several of the more interesting plants were mentioned by Professor

Schrader and Nees Von Esenbeck redundant. Others, from the pen of Schrader, have appeared in the "*Gottingen Gelehrten Anzeig*," 1824-1828: while again, in conjunction with Dr Von Martius, Nees Von Esenbeck published several treatises on these plants in the "*Nov. Act. Acad. Cæs. Nat. Cur.*;" for example—1. "*Beitrag zur Flora Brazil*," Nov. Act., vol. 2. and 12.—2. "*Göthea, novum Genus*," vol. 2.—3. *Fraxinellæ, Plantarum familia naturalis definita, &c.*" vol. 11.—4. "*Zollernia, nov. Gen.*" vol. 13.—"*Hornschuchia*," by Nees Von Esenbeck, appeared in the memoirs of the Ratisbon Society, 1822. The remainder of his collections were presented to Von Martius, who will incorporate them with his Flora.

In 1815 and 1816, two English collectors, Messrs Cunningham and Bowie, were sent by the Royal Gardens of Kew, where many of the plants discovered by them are still living, and where is, moreover, preserved, a considerable herbarium which they formed in Brazil. Both these travellers left the Brazils from St Paulo; the one, Mr Bowie, for the interior of the Cape of Good Hope, where he sank from the fatigues of his journey;* the other, Mr Allan Cunningham, for New Holland, where he spent many years in investigating the interior; and after visiting New Zealand and Norfolk Island, returned to England. Again he went the second time to Port Jackson, as Colonial Botanist, to supply the place of his brother (Richard), who had been killed by the natives. (We have now to lament the death of Allan, from the effect of fatigue and illness, during a second visit to New Zealand.)

The marriage of the Crown Prince Don Pedro, afterwards Emperor of the Brazils, with her Imperial Highness the Archduchess Leopoldine of Austria, gave rise to the expedition of the Austrian Naturalists, which Dr Von Martius, and Dr Von Spix accompanied, and which left Europe in the spring of 1817. For the botanical department were appointed Professor Milcan of Prague, Dr Pohl, (who died in 1834,) Mr Henry Schott, now inspector of the imperial Botanic Garden of Schönbrun, and Mr Ruchberger, Botanic Painter, who lost his life in Brazil by being thrown from his horse. Milcan, during his short residence of one year, paid particular attention to the Flora of the environs of Rio, and afterwards journeyed along the coast to Cabo Frio. In his magnificent *Delectus Floræ et Faunæ Brasiliensis* he has given to the public some of his discoveries. Mr Schott, who is no less an able botanist and draughtsman than he is a cultivator, was however directed chiefly to confine himself to the neighbourhood of Rio, and send living plants to the Imperial Garden at Vienna. Nevertheless he made several excursions from Rio to the Campos on the Paraiba and Paraibuna Rivers, through the district of Canta Gallo and to Macucu. He was afterwards assisted in his labours by the gardener, Schucht. A very choice herbarium of many thousand rare and interesting plants was the fruit of these labours. Dr Pohl undertook a much more extended journey. After having visited the country southerly from Rio to S. Marcos, and northerly as far as the Paraiba River, he went by Barbacena to the Minas country, to Villa Rica, Villa do Principe (passed the Diamond district which was then closed against him,) to the Rio Grande de Belmonte. He then turned westerly to Goyaz, and descended the Rio Maranhano, the principal eastern branch of the Tocantins, to the eighth degree of S. latitude. From Porto Real his route led him back to Villa Boa, and from thence he arrived again at Rio de Janeiro about the end of 1821.

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* Our author has in this particular been misinformed. Bowie was lately, and we believe is still, in charge of Baron Ludwig's interesting Botanic Garden, near Cape Town, Cape of Good Hope.—Ed.

The results of the labours of the Austrian travellers in Brazil, and their Narrative have been published, partly in a separate work, and partly in Pohl's Travels in the Brazils, Vienna, 1831. How much this indefatigable traveller has done for the Flora of Brazil, may be inferred from the great work, "*Plantarum Brasiliæ Icones et Descriptiones hactenus ineditæ. Vindob. 2 vols. fol.* 1827, 1831." Many of the Ferns are published by Presl. The collections that Pohl has deposited in the Imperial Cabinets will soon be made known by the literary labours of Dr Endlicher.

M. Raddi, a Florentine, whose life terminated at the pyramids of Egypt, also accompanied the Austrian expedition of Naturalists to Rio de Janeiro, and botanized there for about a year. From him we have the "*Filices Brasilienses,*" folio; "*Agrostographia Brasil.,*" 8vo.; and some plants which appeared in the 18th volume of the "*Atti della Societa Italiana,*" *&c.*

The two Bavarian Naturalists, Spix and Martius, were, on their arrival at Rio, by command of His Majesty the late King Maximilian Joseph of Bavaria, to undertake a journey into the interior of Brazil, from the tropic of Cancer to the line. They set out in the end of December, and went south to the town of St Paulo, the Iron works of Ypanema, and to Porto Felix, the place of embarkation by the interior to Mato Grosso. Thence they turned to the north, over Villa de S. Joam d' El Rey, to the capital of the gold country, Villa Rica, (now Cidade de Ouro preto.) A journey, branching off to the eastward, through the woods on the borders of the Cordilleras, enabled them to study the characters of the four living races of the Indians. Returning back to Villa Rica, they pursued their route to the diamond district, a country remarkable for the very peculiar nature of its vegetable productions, and which had previously only been visited by M. de St Hilaire. They went from Tejucco up the high plateau of Minas Novas, and again reached the line of the mountain forests and penetrated the Sertas, a hilly territory, where the character of the vegetation is entirely changed, to the Rio de S. Francisco, on the other side of which they penetrated by the Chapada (elevated plains) from Paranan to the eastern springs of the Tocantins in the province of Goyaz. The return to the coast was through the interior of the provinces of Pernambuco and Bahia, to the capital of the last province, where they arrived in a year from the time of their departure from Rio. Thence they went by water to Ilheos, examining the forests of the coasts there, and returned on foot, along the shore, back to Bahia. A second important journey led them in a north-westerly direction, through the province of Bahia by Joazeiro, across the beautiful river of S. Francisco, resembling the Rhine, to the hilly pastures of the province of Piauhy, which they completely crossed in order to reach S. Luiz, the capital of the province of Maranham. Then they took ship to Para, and from that town ascended the Amazon River and the Salimoens to Ega, where they separated for a time, Dr Von Spix following the course of the Salimoens to the boundary of Brazil, while Dr Von Martius, accompanied by Colonel Zany, went up the Yupura as far as the falls of Arara-Coara on the borders of Popayan. Meeting again at the Barra do Rio Negro, they descended the Amazons and visited the lower territory of the Madeira river.

From Para these indefatigable Naturalists returned to Munich by way of Lisbon, at the end of the year 1821; and the number of species calculated to be brought home by Von Martius, is 7,500. Already the public has been favoured with—1. "*Nova Genera et Spec. Plant. Bras.*" 3 vols., the first of which is edited in part by Zuccarini, 1823—1829, with 300 plates.—2. "*Genera et Species Palmarum,*" very large atlas folio (scarcely yet completed.)—3. "*Icones Selectæ Plantarum Cryptogam.*" 1 vol.—4. *Specimen Materiæ Medicæ Brasil. Part* I. *Emetica.*"—5. "*Travels in the Brazils,*" 3 vols. 4to., 1823—1831.—6. "*The Physiognomy of the Vegetable Kingdom in the Brazils.*"—7. "*Soemmeringia, Novum Plant. Gen.*" (*Legumin.*).—8. "*Fridericia, Novum Plant. Gen.*" *in Nov. Art. Acad. Vol.* xiii.—9. "*On the Preparation of the Urari Poison employed by the Juris Indians on the Rio Yupura,*"—"*On some Brazilian Medicines,*"—*On some Medicinal Plants,*" noticed by Dr Von Martius, in the Brazilian province of Rio Negro, given in Buchner's Repertorium of Pharmacy.—10. "*Decas Plantarum Mycetoidearum Brasiliensium, in Nov. Act. Acad.*" vol. x.—11. "*Lychnophora, Novum Plant. Gen.*" (*Composit.*), in the Memoirs of the Royal

Bavarian Bot. Soc. at Ratisbon, 1822.—12. "*On several Species of Plants raised from Brazilian Seeds*," in different works, such as Schrank, *Hort. Monac.;* Martius, *Amæn. Bot. Monac.; Hortus Reg. Monac.;* in Collas' *Hortus Ripul.;* in *Link. et Otto Ic. Plant. Sel., &c.*—13. "*Flora Brasiliensis Enumeratio Plant. in Brasilia*" *&c.*, 8vo., only 2 vols. of this have yet been published; one on the *Algæ*, by Martius; the *Lichens*, by Eschweiler; and the *Hepaticæ*, by Nees Von Esenbeck; the second containing the *Grasses*, by Nees. Professor Hornschuch has been engaged upon the *Mosses;** Professor Kunze on the *Ferns;* Dr Spring has prepared the *Lycopodineæ*. The *Cyperaceæ* have been commenced by Schrader. Professor Roeper will undertake the *Euphorbiaceæ;* Nees the *Solanaceæ* and *Acanthaceæ*. Many Monocotyledones are already finished for (and since published in) the 6th vol. of *Römer et Schultes' Syst. Veget.;* and various other of Dr Von Martius' materials have been taken up, through his liberality, by many other Botanists; for example by Zuccarini in the *Roy. Bavar. Trans.*, and in his *Fasc.* i. *Plant. Nov. &c.* M. De Candolle has in his Prodromus inserted the *Myrtaceæ*, *Melastomaceæ*, and a part of *Lythrarieæ* and *Compositæ;* Mr Bentham has included the *Labiatæ* in his valuable Monograph of that family. Nees Von Esenbeck undertakes *Laurineæ;* Professor Lindley the *Orchideæ;* and again Bentham the *Leguminosæ*.

After M. de St Hilaire, Mr Pohl and Dr Von Martius, had left Brazil in 1823, Mr Beyrich, an industrious and able gardener, went to Rio, at the expense of the Berlin Garden, which, as well as the Herbarium, he enriched with numerous interesting objects. After his melancholy death from cholera, in N. America, his extensive private collection came into the possession of Baron Von Römer in Dresden, and many of his discoveries have been made known by Chamisso and Schlechtendal in the *Linnæa*, where his memory has further been perpetuated by the establishing of the Genus *Beyrichia*, among *Schrophularineæ*.

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* I believe a *Fasciculus* of this has since appeared in small folio, with plates, together with the *Lycopodineæ*.

At the same period as Mr Beyrich, Baron Von Karwinski visited Rio de Janeiro, and formed a collection in the Organ Mountains, which has since passed into the hands of Von Martius. Mr Von Langsdorff at this time, by command of the Imperial Russian government, now prepared for a very extensive journey, which was to extend to the most distant territory of the Brazils; but respecting the results of it, little seems to be known, and Langsdorff himself came to Europe, in a very indifferent state of health. Accompanied by Mr Riedel, an able Botanist, by Mr Tanney a botanical draughtsman, M. Menetrier, as Zoologist, and Mr Rubzow, as astronomer, he first went to Cuyaba, then to Mato Grosso, and lastly down the Madeira and Amazon Rivers to Para. Although the life of the artist was sacrificed, and that the party suffered various misfortunes, the expedition yielded an abundant harvest of plants, which together with many former collections sent to the Imperial Garden and the Academy of Sciences at Petersburgh, have made the northern imperial city one of the richest in Brazilian Natural History. Thanks also to the great industry of her Botanists, we possess, besides many others from the same quarter, the following valuable additions to our knowledge of Brazilian vegetation:—"*Bongard, Essai monographique sur les espéces d'Eriocaulon du Brésil*," in the "*Mem. de l'Acad. de St Petersb.* 1831,"—and the same author's "*Generis Lacis Revisio, adnexa Philocrene, gen. e Podostemearum ordine novo*." Mr R. Bongard has also described several species of the Genera *Bauhinia* and *Pauletia*. Trinius, in his great work on *Grasses*, has made use of all the remarkable additions of this difficult family which the Brazils yield so abundantly. Dr Von Fischer, too, has published many of Langsdorff's discoveries, sometimes in conjunction with Mr C. A. Meyer.

Respecting another journey which took place in the southwestern parts of Brazil, at the same period as the above, namely, that of Mr Burchell, we have no accurate accounts. He had already distinguished himself by his scientific travels in the interior of Southern Africa; and he is said to have taken home noble collections from the provinces of Minas, Goyaz, and Mato Grosso; but at present we hear nothing of the probability of their being published. Other Collectors have been engaged in procuring Seeds, Bulbs, and especially *Orchideæ.* The later volumes of the *Botanical Magazine*, and *Botanical Register*, record the names of Harrison, Pearson, Hasketh, &c., as having introduced to Europe plants new to the Flora of Brazil. A highly accomplished English lady, Mrs Maria Graham, now Mrs (Lady) Calcott, has sent collections of dried plants and drawings, which she made in Brazil, to the English Naturalists. Mr Tweedie has collected extensively on the banks of the Uraguay and in the Banda Orientale, plants which have been described by Messrs. Hooker and Arnott in their valuable "*Contributions towards the Flora of South America,*" in *Hook. Bot. Miscel. vol.* iii. *&c.*, or by Dr Graham in the *Edinburgh Journal of Science.* Many other Botanists might be named, who have contributed to increase the catalogue of the Flora of Brazil; as for example, Mr Lund, Dr Dollinger, Luschnath, and others, at Rio; Bacle at St Catharine; Blanchet, and Salzmann, and Lhotzky, and Vauthier, &c.; all have contributed to the "*Prodromus*" of De Candolle, the "*Atakta*" of Endlicher, Presl's "*Symbol. Bot.,*" and other works. Mr Lhotzky has also sent many plants which were gathered by that industrious Brazilian physician, A. L. Patricio da Silva Monse, during a residence of several years at Cujaba. In conclusion may be mentioned the services rendered to Brazilian Botany by Professor Poeppig. In his very extensive and successful journey, he also entered Brazil on his way from Maynas down the Rio Solimoens and the Amazon River to Para. At Ega, and in the neighbourhood of the last mentioned city, this excellent Naturalist remained for some time; and his collections include those which Von Martius made ten years before in the same districts. He has also, with the courtesy which distinguishes the man of learning and science, placed his Brazilian collections at the service of the author of the Flora of Brazil.

II. *Character of the principal regions of the Flora of Brazil.*

The vegetable kingdom in the Brazils presents in general, if it may be so expressed, a fixed character, especially if the tropical regions be more particularly considered. In regard to individual plants, this exhibits itself in the great exuberance of the ramifications of the leaves, in the profusion of flowers and fruits, and in the absence of those forms of the organs which arise from a stunted growth, or a want of development, such as thorns and spines, &c., exhibit. Thus, one sees gigantic, copiously branched, herbaceous plants, loaded with dark-green foliage, and flower-stems adorned with blossoms, glowing with every colour; though the reds, violets and yellows, are more abundant than blues and whites. The bark of the trees is thin in proportion to the size of the trunks, and it does not peel off as in N. Holland, for example, where the ground resembles a tan-yard, from the quantity of bark with which it is strewed. The greater number of plants are smooth and naked on their surface; only in the extratropical parts, generally speaking, and in some elevated or saline situations, do we find the clothing of hair and tomentum to prevail on the leaves, or other soft herbaceous parts.

With the exception of some genera, such as *Chorisia*, *Pachira*, *Eriodendron*, *Bombax*, *Wittelsbachia*, *Lasiandra*, and many *Orchideæ*, the flowers are not so large and magnificent as in the Flora of Southern India, though larger than is common in other tropical regions. The extraordinary variability in individual plants, according to habitat, climate, and age, is a characteristic of this tropical vegetation, and this makes the study of the various forms not a little difficult. The size and shape of the leaves, especially at the base and apex, the degree of hairiness, the texture and thickness, the inflorescence, the outline, (and in a less degree the colour,) vary *ad infinitum* in the vegetable productions of Brazil, according as the species grows fully exposed to the light of the sun, or in the shade; on lofty hills, or on low ground; on elevated plains, or on river-banks; in stony places, on decayed dung, or on moving sands. Frequently one and the same tree, if growing half in the light and half in shade, will exhibit different degrees of hairiness in the different parts, as is observed with the Mango, (*Mangifera Indica*); and the fruit is different in the quantity of saccharine, in aroma, in absence or presence of resins, &c., as they may chance to be produced by one or another branch. Another circumstance that distinguishes the Flora of the Brazils (and indeed that of the tropics generally), is the extraordinary disparity in the size of the individual parts of the leaves and flowers; for example, according to its age, to the season of the year, and its locality. Many produce flowers when very young, and then the foliage and blossoms are of small size: others require a great degree of maturity in the wood in order to bear fruit, and are at first sparingly clothed with blossoms; sometimes in every part. The leaves of the fruit-bearing ones are often 3 or 4 times as large as those of the same plant in a state of flower, and the substance and texture are equally altered. The leaves of those trees which in the spring, that is, after the rainy season, usually expand rapidly, are at first thin and delicate, but by degrees they become so thick and coriaceous that specimens from the same tree, gathered at different periods, will frequently appear to a botanist accustomed to the European forms, as belonging to a different species. It is the same with the leaves and flowers, when an individual of the same species grows in the moist primitive forests along the sea-shore, and in the dry forests in the interior of the country seldom refreshed with rain. In the latter case the ramification, the thorns, the reticulation of the leaves are much more copious than upon the coast. Whilst the Flora is the poor tropical vegetation, there may in general be a great diversity in the forms of the species; so, on the other hand, in the luxuriant tropical vegetation, there is a great closeness and affinity of species in one and the same genus. These close boundaries of the specific forms, and the variableness of the individuals, are substantial difficulties in the study of a Flora so rich in species as that of Brazil. The *Melastomaceæ* and *Myrtaceæ* of the Brazils, that are in De Candolle's *Prodromus*, may serve as an evidence of the correctness of this assertion. It is, therefore, not surprising, if many species are already introduced into systematic works, whose right to that rank will be doubtful, until they are more studied in their original localities. With a view to these two circumstances, must be taken into consideration that which will necessarily escape the traveller who passes hastily through the country: I mean the formation of hybrids, and the difference of the individual in the development of the flowers in the two sexes. There can be no doubt that the numerous insects in Brazil industriously visit the expanded blossoms, and produce similar effects to what are known to occur by a similar cause in Europe. So, too, will greater accuracy, and much time, be required to prove that certain variations in the growth, the inflorescence, even also in the leafing, are or are not occasioned by the differences of sex in the numerous polygamous and diœcious plants that occur in the Flora of the Brazils, and which have not been accurately distinguished. Similar differences with those in the German species of *Tussilago*, or in *Serratula arvensis* (ascertained by Mr Brown to be diœcious) will be discovered in Brazil in many species of *Eupatorium*, *Mikania*, *Baccharis*, *&c.*

After these few introductory observations on the character of the Brazilian vegetation in general, Von Martius proceeds to offer some remarks on the peculiarities presented by the different regions of the vegetation in Brazil. There, as in every Flora of great extent, are spread over the wide surface of the country, various masses or groups of vegetables in such a manner, that each in its intensity, that is, where it appears complete and unmingled, bears its own peculiar character. This character is recognised no less physiognomically, in the stamp of its whole picturesque appearance, than systematically in the number of the prevalent plants and families of plants. But as each of these peculiar masses of plants have their limits, and pass into another, so is their character blended and changed. Von Martius distinguishes five principal regions which were first recorded by him in the "*Agrostographia Brasiliensis.*"—1. *Regio extra-tropica*, or *valleculosa*, most of which is hilly country beyond the southern tropics. 2. *Regio montana*, or *montano-campestris*, the high land covered with fields. 3. *Regio montano-nemorosa*, or wooded mountain-land. 4. *Regio calido-sicca*, the dry northern district. 5. *Regio calido-humida*, the moist equatorial district.

I. REGIO EXTRA-TROPICA.—South Brazil beyond the tropic of Capricorn to Monte Video, and to the river La Plata. The plants of this district Martius designates by the general name of *Napææ*. The country is either plain or gently undulated, rarely rising into mountains (scarcely ever exceeding 1600 feet high). It is, however, tolerably well watered, although many of the lesser streams dry up annually, entirely or in part. The mountain-formation is partly granite, gneiss, and sienite; partly, especially in the more southern districts, the trap-formation prevails. The forests are only numerous in the more southern districts; and here you see a vast extent of the Brazilian Pines, *Araucaria Brasiliana*. The farther you proceed to the south, the forests become more rare; and, mingled with the American, we find the European forms of vegetation. On the other side the Plate river this region passes into the Pampas of Buenos Ayres, which extends from thence to Cordova, and to the eastern sides of the Andes of Chili. The tropical forms of the Brazilian vegetation descend here and there in this district along the rivers that flow from the north, but lose themselves the more as you go into the interior from the coast. This region has been particularly investigated by Messrs Auguste de St Hilaire and Sellow.

II. REGIO MONTANA, OF MONTANO-CAMPESTRIS.—Under this head are included that of the great Brazilian mountain-system, which constitutes the interior of the province of Minas to the west, and extends through the Serra dos Vertentes (as M. Eschwege calls it), to the upper valley of the river of Madeira, the Rio Itinêz, or Guapocê, and towards the north in the province of Bahia, terminates with several narrow branches in the Comarca of Jacobina. This long district, situated between the 46th and 65th of west longitude from Paris, and between the 23d and the 11th degree of south latitude, also includes a part of the provinces of Rio, S. Paulo, Minas Geraës, Goyaz, Mato Grosso, and Bahia. Low valleys, steep declivities of mountains, gentle declinations, and elevated plains, here alternate with each other, and the highest mountains attain to above 5000 feet. The prevailing mountains here are quartz slate (Itacolumit, quartzreicher Glimmer-oder Falkschiefer); or they frequently contain "Flötze" of ironstone. Gold occurs almost everywhere, and diamonds are found.

The greater part of this district is covered by grass-plains, on which are seen, scattered, a great variety of beautiful flowering herbaceous plants and low shrubs or copses. Here are also woods possessing two different characters; the lofty evergreen woods, which are pretty similar to those along the coast, and isolated lower, very dense, and not altogether deciduous ones. The first, especially, affect the banks of the rivers, and ascend from the lowest districts of the country, at most, half way up the mountains. They are destroyed in the mountain districts in the same way as in the United States, and burnt; and, this being the most fertile part of the country, is under cultivation. In the language of the country this is called Mato virgen, virgin forests (tupi: Caa-eté). The other kind of woods besides, being of much lower growth, is particularly characterized by the low wet grounds in such a manner as to resemble islands, mostly of a roundish form. Many of them have swampy bottoms, others contain springs, the sources of brooks and rivers. They are called in the language of the country Capoens, island-woods. They never ascend to the ridge of the higher mountains, which is only covered, in the whole Regio-montana, with bushes or herbaceous plants, whilst in the northern part of the Regio-extratropica, it is wooded even to the very summit. Two other vegetable features occur intermediate between the forms already alluded to, particularly in the north-western and northern parts of this district: the one is characterized by numerous, low stunted, and much ramified trees, whose branches frequently spread out horizontally. They are seen most abundantly on gentle declivities, table-mountains, and elevated plains, and on this account, and because they often afford no shelter to the traveller, they are called Taboleiro coberto (covered table-land). The trees of this formation are mostly very peculiar, and different from those of other woods. The second form, and which likewise most frequently occurs in the north-western and northern parts of this territory, and which constitutes the transition into another, is a peculiar kind of thick bushes (Carrasco, or when larger trees intervene, Mato carrasquento). These last kinds of vegetation in the mountain district mostly lose their foliage during the dry months, often flower before they throw out fresh leaves, which are at first soft and tender, but quickly hardening and becoming as it were sapless. The plants of this mountain-region Martius distinguishes by the name of *Oreades.*

III. REGIO MONTANO-NEMOROSA: the district of mountain-forests. To this especially belongs the Cordillera of the coast (Serro do Mar), which extends from the province of S. Paulo to Bahia, and northerly from it to the other side of the Francisco river, in the provinces of Alagoas and Pernambuco. This particularly consists of granite, gneiss, and sienite. On account of the vicinity of the sea, and the dense forests moistened by the numerous clouds, it is abundant in springs. It is of inferior elevation to that of the Minas district, some few of the rounded summits only attaining an elevation of about 4000 feet. It maintains a peculiarly luxuriant, rich and brilliant Flora, which, although it has been the most investigated, will yet for a long time yield novelties to the botanist. The plants belonging to this district Martius calls *Dryades*. Towards the north the Flora of this mountain-range changes considerably ; so that many of the species that grow in the south disappear, and other related kinds supply their place. The three provinces that have been most searched, viz., Bahia, Ilheos, and Rio de Janeiro, have each of them certain peculiarities, yet in their physiognomy corresponding forms. It appears too that the Flora of Rio is distinguished above all others by greater magnificence in form and colour. The mountain of this region is in connexion with the extensive principal crest of the former region by several spurs, which diverge from near the 47° of west longitude to the north, and are called Serra da Mantiqueira, das Almas, da Lapa, &c., and is comprehended by Eschwege, under the common name of Serra do Espinhaço. On these spurs, or cross-branches, generally appears a different vegetation from that of the mountain-district itself, and that of the forests on the west, which mostly exhibits that of the Catingas woods.

IV. Regio calido-sicca. North from the principal mass of mountains of the Minas district, and easterly from the line of mountains of the Serra do Mar, extends a large level land, frequently rising into low hills, which, from the dryness and uniformity of the climate and the absence of water, is occupied by a very different vegetation from that hitherto noticed. The mountain-formation is here mostly granite and gneiss, sandstone or chalk, and, though more rarely, "*Diorit*" and mica-slate. The elastic sandstone, (Eschwege's Itacolumit already mentioned,) which appears characteristic of the mining district, is seldom seen here, nor is there found that abundance of gold and of diamonds. On this account it is less inhabited by colonists, and has received the name of *Sertam* (wilderness) ; a word also employed to denote the thinly populous districts in the very interior of Brazil. At Minas Geraës they designate by *Sertam* the tract of country situated westerly and north-westerly from the peculiar mountain heights so abundant in gold. The country here gradually sinks down to the Rio de San Francisco, and rises again on the other side in the Table-land of Goyaz. Further towards the north is a country of a similar nature, which includes the interior of the province of Bahia, the south-western part of the province of Pernambuco, and the valley of the province of Piauhy. The heat is much greater than in the same latitude upon the coast, or than in the more elevated Minas district; for the present region, with the exception of the small range of Carriri mountains and their ramifications, scarcely exceeds 1000 or 1200 feet above the level of the sea. The rains that commence in October in the more southern parts, further to the north prevail from December to January, and sometimes fail almost entirely for several years. The winds that blow in the districts beyond the Tropics, frequently with great violence, particularly from the south-west, are here of rare occurrence; and often the clear, pure and dry air, continues for months without any variation. This characteristic of the climate, together with the almost total absence of vegetable mould ("dammerde"), occasion a great variation of the Flora of this country from that already treated of. The forests are of less extent, and are either in the neighbourhood of rivers, or on the mountains, which are covered by them even to the summits, if they are sufficiently elevated to experience a current of moist air which comes from the coast: thus producing a coast-climate. The low grounds, in which the dew most frequently supplies the place of rains, are especially covered with shrubs and bushes. As the plains frequently expand very suddenly, and are overrun for an immense extent with shrubs of a man's height, so we here find ourselves as it were in an ocean of plants. This vegetable feature is called in the country *Carrasco*, and is, of all that exist in the tropics of the Brazils, the poorest in species, although it may be abundant in individuals. It clothes a great part of the country on the other side of the Rio de San Francisco, the whole interior of Goyaz, Pernambuco, and the northern provinces of Rio Grande and Ciará. The forests that exist here have seldom that fulness and the lofty growth of those of the coast, and, during the dry months, the leaves are deciduous, on which account they are called in the language of the Brazils, *light forests* (Caa-tinga.) What is extraordinary, if no rain falls, they can remain for many years without producing foliage, but when at last the showers descend, in the course of forty-eight hours they are clothed with the most delicate and tender green. Many plants of this Flora have the flowers produced before the leaves, or during the time of the bursting of the foliage, and many do not ripen their fruit till after they have again dropped their foliage. It is in this district that so many *Cacteæ* are seen: while the general vegetation is distinguished by the tenderness of fibre, rigidity of the leaves, the presence of hairs, stings or prickles, smaller flowers, thicker and frequently milky juice. The pastures differ from those of the mining district, in that they exhibit a bright green, more delicate and smoother herbs, and *Gramineæ* with more pliant leaves. The Brazilians call them *Campos mimosos*, in contradistinction to the *Campos agrestes* of the Minas Geraës. Hitherto the individuals of this form of vegetation have been less known than the others. Dr Pohl has however placed numerous species from this district in the Imperial Herbarium at Vienna, (and we may add, that Mr Gardner has recently formed a very rich herbarium there. —Ed.) Martius designates the plants of this district as *Hamadryades.*

V. Regio Calido-humida.—Northerly from the province of Ciará the country declines down towards the great plain of the Amazonian River. The mountains, which are exceedingly curious in structure, and are deeply covered with vegetable soil (Dammerde), consist principally of sandstone. A vast abundance of springs, numerous streams, rivers and lakes, very frequent rains continuing to fall through the greater portion of the year, and moisture during the latter part of it, brought by the winds from the Atlantic Ocean, all here unite in producing the greatest vigour and luxuriance of the vegetable growth. Dry situations are scarcely to be met with, except on the sides of some of the low hills in the interior of this almost wholly unexplored tract, between the Ocean and Madeira River. As the vegetation here so much depends on the abundance of water, Von Martius calls the plants *Naiades.* By far the greater part of the country is covered by very lofty forest vegetation (Caa-eté,) which in the neighbourhood of the waters (where it is called Caa-Ygabó) is particularly intricate and wild, but never so grand, or so beautiful, as the forests of the more south-eastern parts of Brazil. Pasturage does not exist here as in the elevated lands of the mining districts, but is found chiefly on the light hilly lowlands, seldom on the low scattered mountains. The group of Parimé-mountains in the north, and the ramifications of the Andes bound this extended tract of land to the north and west. A lower, rougher, and very stunted border of forest, in its individual character extremely peculiar, (the Ceja de la Montana,) appears to mark the boundary of this vegetation, and that of Peru on the borders of Popayan and Maynas;—and this kind of vegetation extends into the district of the great Rio de Madeira, far to the south, beyond the union of the Iteney or Guaporé and Mamoré. Its extreme boundary in the south may be taken at about the 13° of S. lat. (near the Destacamento das Pedras,) where the banks of the river are more elevated and steeper, so as to check the floods, and where the branches of the Serra geral de Cujabá in the west, and the Serra dos Guarajus in the north, mark the commencement of the mining district. Brazil therefore presents, on its northern and western sides, a very connected Flora which encloses a great portion of the other vegetable districts. The plants of Mato Grosso appear all to belong to this line of vegetation: or if from the higher districts of the province, (which is known to agree in the mountain-formation, and its riches in gold and diamonds, with Minas Geraës and the highlands of Goyaz,) they are then constituent parts of the mountain Flora, sometimes the same species as those found further east, oftener species of similar genera. Links of these vegetable forms occur along the Madeira River and the other great tributaries to the

Amazon, and each of these rivers appears, agreeably to its geographical extent and to the nature of its high lands at the sources, to possess its peculiar Flora, which assimilates itself the more to that of the Amazon the nearer they approach the latter. The Flora of these large tributaries has hitherto been scarcely examined.

The regions that have now been noticed in their general outline may properly be considered as the principal ones, or provinces of the empire of the Brazilian Flora. Many, we may say, by the greater part of the individual species, belong to one or other of these regions. Certain plants, however, are spread over many regions: many of the *Dryades* and *Hamadryades* appear throughout the whole extent of the tropics: so it is likewise with many of the trees that belong to the *Regio montano-nemorosa*, and the *Regio calido-sicca*. Numerous herbaceous plants are equally generally distributed. These widely extended plants Von Martius terms *Vagæ;* and many of these, he observes, belong to the northern tropical formation of Eastern South America, or of the Flora of the Orinoco district, as a province of the empire of the Flora of Brazil, whilst the *Regio extra-tropica*, of *Plantæ Napææ*, ought to be reckoned to belong, not to this empire, but to the Flora of Buenos Ayres, Tucuman and Salta, or that of the cis-andine extra-tropical empire.

VI. The principles for the formation of the *Herbarium Floræ Brasiliensis* are in part indicated in the preceding introduction; the rest are scarcely of sufficient interest to induce us to make extracts from them.

II.—*An arrangement and definition of the* GENERA OF FERNS, *with observations on the affinities of each Genus;* by J. SMITH, A. L. S.

[*With Figures of the Venation of Ferns.* TABS. XVIII. XIX.]

(Read before the Linnæan Society of London, February 18, April 7, and June 16, 1840.)

THE vast number of new species of Ferns which have of late years come to our knowledge, renders it necessary that some additional characters, besides those hitherto used, should be adopted for defining the limits of genera. The necessity for this will be obvious, when it is stated that the number of known species amounts to between 1600 and 1800, of which probably about three-fourths have, till lately, been placed under six genera; *viz., Acrostichum, Polypodium, Pteris, Asplenium, Aspidium*, and *Adiantum;* and, as might be expected in such extensive assemblages of species, many must have been associated under the same genus, although having no immediate affinity with each other, further than in some arbitrary technical character. This has arisen from the generic characters of Ferns having (with a few exceptions) been derived solely from the form, position, and direction of the sori, in conjunction with the sori being naked, or furnished with an indusium of different forms. Such being the case (and having formed a collection of Ferns amounting to about 1400 species) I became anxious to arrange them in more natural groups, and, with that view, I made a critical examination of the whole. While so engaged, I was not inattentive to the observations of Mr Brown, in the *Prodromus Floræ Novæ Hollandiæ*, and also in *Wallich's Plantæ Asiaticæ Rariores;* and following up that gentleman's observations, as regards the position of the sori on the veins, I found that the different forms of venation afforded, in conjunction with the position of the sori, very important characters, which I first made use of, in the year 1835, for arranging the very extensive genus *Polypodium*, and it was no little satisfaction to me when I found that my

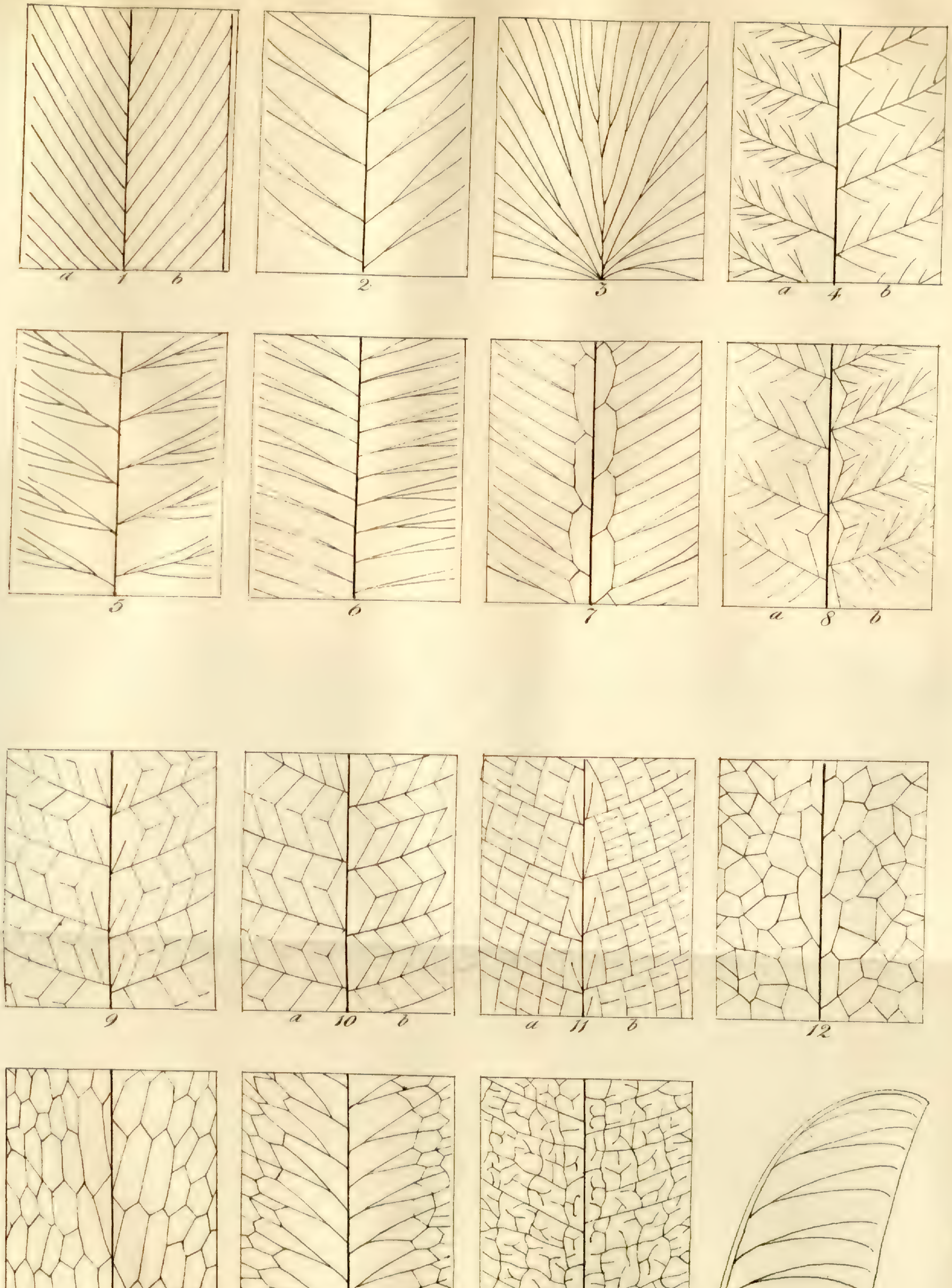
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Diagram of the principal forms of venation.

views of that genus so nearly coincided with those of Mr Brown, which were shortly afterwards published in the *Flora Javanica.*

I had nearly completed my arrangement when I received a copy of Presl's " *Tentamen Pteridographiæ,*" a work published at Prague in 1836, but not seen by me till 1838. That author's views so nearly coincided with mine, that it might seem as if a communication of ideas had passed betwixt us; but, after allowing him due credit for his labours, I must still continue to differ from him in a number of important points; yet, in order to avoid adding synonymous generic names, I have revised my original terms, and in all cases where Presl's character of his genera are conformable to my view, I have adopted his names.

It may be said that many genera have been created with only trifling differences. But, when the technical characters of several proximate genera of Ferns are compared with the technical characters of a like number of genera belonging to any other extensive natural family of plants, I may safely say, that the genera of Ferns here given will be found to have as good a right to rank as genera, as those of *Gramineæ, Liliaceæ, Orchideæ, Leguminosæ,* &c.; and Ferns, like these large families, present very obvious distinctions on viewing species of distant affinities; but, on taking a comprehensive view, a gradual transition of form is seen to pervade through the whole, not in a lineal, *but* in a complex, reticulated manner. And, by making use of certain modifications of structure, (which may be common to one or more species) I have been enabled to classify them under what may be termed genera; and in the following arrangement, I will endeavour to show, they are so connected with one another, that, in many cases, it becomes very difficult to determine in which genus the extreme or transition-species of groups should be placed, thus proving, that in proportion as we become acquainted with a great number of species, the more we find that "a genus has seldom any real existence in nature as a positively determined group, and must rather be considered as a mere contrivance for assisting us in comparing and studying the enormous multitude of species, which, without arrangement, our minds could not embrace."*

It sometimes happens, that although certain species agree with others in venation and the character of their sori, &c., yet they differ most essentially in what is termed their general *aspect* or *habit.* In such cases, rather than form unnatural combinations of species, I have chosen to keep them separate, although even their technical distinctions be but slight; and my reasons for so doing will be noticed under those genera so circumstanced, and I am inclined to believe that in these and other cases, distinctive characters are yet to be discovered, by a careful examination of their more obscure structure.

In the following arrangement, the first division of importance is characterized by the sporangia being *destitute* of, or *furnished* with an elastic articulated ring, which surrounds the sporangia, either in the direction of its attachment, *(vertical)* or at a right-angle to the attachment *(transverse);* which character divides Ferns into three very unequal groups or suborders; the exannulate group not numbering more than 100 species, while about half that number may be said to compose the truly transverse annulate group or *Gleicheniaceæ;* therefore, the great mass of the species are characterized by the presence of a vertical ring, and comprise what have been termed true Ferns, or *Polypodiaceæ.* This group I have divided into seven tribes, characterized by the different forms and position of the sori and indusium, and although their distinctive characters are in general well marked, yet many instances occur where they are found forming transitions into one another, through some approximating points of structure. Before entering upon the definitions of these tribes and their genera, it will be necessary to give a brief explanation of the principal parts upon which their distinguishing characters are founded, and in so doing I have to observe that it is extremely difficult to give names that will define precisely all the various gradations of structure, and consequently due allowance must be made for all seeming misapplications of terms.

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* Bentham.

DEFINITIONS.

Ferns are flowerless plants, consisting of leafy fronds which are produced from a *rhizoma*, unfolding in a spiral manner, and traversed by *veins*, which, from definite parts on the under surface, produce unilocular, rarely multilocular cases (*sporangia*), containing reproductive sporules.

The rhizoma is a rootlike creeping or cæspitose *caudex*, emitting descending fibrous radicles, and ascending fronds, often becoming an arboreous, usually hollow, cylindrical trunk.

The fronds are of various forms, dimensions, and textures, sessile or stipitate, and either attached to the rhizoma, by a distinct lateral articulation, or decurrent, persistent, and terminal; their united bases forming the progressing rhizoma. They vary from linear-lanceolate to deltoid, and from less than an inch to 15 or 20 feet in length, and from simple, entire, to once or many times pinnate and multifid; each ultimate pinna, or segment, being analogous in its parts to a simple frond. Their surface is either smooth, or furnished with different kinds of glands, hairs, or membraneous scales, the fertile or sporangiferous fronds or segments often contracted and differing in aspect from the sterile.

The veins are either produced equally from both sides of a midrib (*costa*) (*fig.* 1, 2, 3, 4, &c.), or radiate from the base or axis of development, the midrib being evanescent (*fig.* 3.); or from one side of an eccentric, or unilateral costa (*fig.* 16.) They are either simple (*fig.* 1.), or once or repeatedly, dichotomously branched (*forked*) (*fig.* 2, 3, 5, 6, 7, 8.); or the primary veins are *costæform and pinnate*, (*fig.* 4, 8, 9, 10, 11.), the branches (*venules*) either simple or forked (*fig.* 4. *a*. *b*.) Their apices are either free and terminating at or within the margin (*direct*) (*fig.* 1. *a.* 2, 3, 4, 5.), or the whole combined by a continuous anastomosing vein which runs parallel with, and close to the margin (*transverse marginal*) (*fig.* 1. *b.* 6.); or, the apices of the venules of each fascicle anastomose with the apices of the venules of the proximate fascicle, in an angular or arcuate manner, and produce, on their points of meeting, or exterior side, one or more outwardly directed, (*excurrent*) tertiary veins (*veinlets*), which are either free and terminate in the areoles or margin (*fig*. 7. 9. 10. *a*. 11. *a*.) or anastomose in the angular junction of the next superior pair of venules (*fig*. 10. *b*. 11. *b*.); or, the whole venation is nearly *uniform* and combined, forming equal or unequal-sided areoles, with all the venules connected (*reticulated*) (*fig*. 12, 13, 14.); or irregularly combined, and the areoles producing, from their sides, excurrent or recurrent, simple, forked, or brachiate, straight or uncinate, free or conniving veinlets, which terminate in the unequal sided areoles (*compound anastomosing*) (*fig*. 15). The whole being more or less superficial, and distinct, plane, or elevated (*external*), or immersed in the substance of the frond, and then often indistinct (*internal*).

The *sporangiferous receptacle* is a thickened point or lengthened portion of the ultimate venules or veinlets, and is either formed on their apex (*terminal*), or between their apex and base (*medial*), or on the point of forking (*axillary*), or on the angular crossings or points of confluence of two or many venules or veinlets (*compital*), or the whole or a portion of the disc of the frond is changed in texture, and closely occupied by the sporangia (*amorphous*). It is generally superficial, sometimes immersed in the substance of the frond, or considerably elevated, and then globose or columnar.

The sporangia are transparent, globose, oval, or pyriform, unilocular cases, each girded by a more or less complete, elastic articulated ring, or destitute of a ring, then sometimes oblong, opaque and multilocular; usually pedicellate, rarely sessile, produced in crowded masses (*sori*) on each receptacle; rarely solitary or few, sometimes pilose, and a number often abortive and deformed.

The sori are collections of sporangia, and have the same form, position, and direction, as the receptacles; therefore *round*, *elongated*, or *amorphous*, and seated on or close to the margin (of the frond or segment) (*marginal*), or between the margin and midrib (*intramarginal*), or close to the midrib (*costal*); when elongated they are either oblong or linear, constituting a continuous or interrupted line, which forms more or less of an angle with the midrib (*oblique*), or runs parallel with the midrib or margin (*transverse*). They are either naked, or each sorus is furnished with a membranaceous covering of various forms called *indusium*, which rises from the receptacle.

The *indusium* is a plane, or vaulted, or cup-shaped membrane, produced from the receptacle of each sorus (*special*), and is generally deciduous as it becomes replicate. It is either produced from the centre of the receptacle (*central*), or on one side (*lateral*), or its base is attached all round the base or margin of the receptacle (*calyciform*). When central it is usually *orbicular*, with its margin depressed and free all round, or sometimes it is inflated. When lateral it is either *reniform*, *oval*, or *oblong*, and attached by a point or depressed sinus of its side; or *linear* and attached its whole length on the side of an elongated receptacle; the other margin free. When calyciform, it is first entire and globose, at length opening with an entire or laciniated margin, forming a cup which contains the sporangia. Often the entire margin or lobules of the frond is changed in texture, and forms an accessory indusium, with which the interior lateral attached special indusium more or less connives, and by their union they form a vertical or reflexed, continuous or urceolate, calyciform or bilabiate, marginal cyst, which contains the sporangia, and is open exteriorly.

Sometimes the whole of the sori of each segment are included within a universal indusium, which is formed by the revolute margin of fertile contracted fronds.

Obs. I. In the definitions of the venation and sori, it must be understood that the whole is derived from a combined view of the structure on one side of the ultimate midrib, unless otherwise specified.

Obs. II. The intention of this paper being merely an attempt to point out the principal features which characterize the natural groups of ferns, I have therefore refrained from giving anything more than a few examples of the species belonging to each genus; as also a reference to one or more published figures which best exemplify the genera. I have also refrained from making any observations on the geographical distribution, as locality seldom marks any genus which contains more than one *species*.

DIV. I. POLYPODIACEÆ. *R. Br.*

Sporangia globose or oval, transparent, unilocular, pedicellate, rarely sessile, opening transversely, furnished with a vertical, or rarely oblique, elastic, articulated, nearly complete *ring*.

TRIBE I. POLYPODIEÆ. *J. Sm.*

Sori round, oblong or elongated and linear, destitute of a special *indusium*. (Sometimes the fertile fronds are contracted, the margins of which are usually membraneous and revolute, forming a *universal* indusium which includes the whole of the sori of each segment of the frond.)

Obs. This tribe contains upwards of 400 species, the typical form being exemplified by the extensive genus *Polypodium*—as characterized by Swartz, Willdenow, and others; and, according to their character of the genus, it would now contain above 300 species, but which in the following arrangement are divided into a number of genera, characterized by the different modification of the veins, in conjunction with the position of the sori on their branches. The remaining species of the tribe have hitherto been distinguished from *Polypodium*, by having elongated linear sori, but their venation is now also made use of for characterizing the genera.

SECT. I. ORTHOPHLEBIEÆ. *J. Sm.*

Veins simple, forked or costæ form and pinnate, the whole direct, and free.

1. MONOGRAMMA. *Schk.*

(Grammitidis *sp. Sw.* Cochlidium. *Kaulf.*)

Costa sporangiferous longitudinally on its centre, forming a solitary, continuous or interrupted, linear *sorus.*—Fronds 2 *to* 4 *inches high, linear, simple or forked, furnished with a midrib only, concave towards the apex, which includes the* sporangia.

Examp 1. M. graminea. *Schk.* 2. M. furcata. Desv. 3. M. trichoidea. *J. Sm.*—Illust. *Schk. Crypt. t.* 87. *Schott. Gen. Fil. t.* 17, *&* 18. *Hook. Gen. Fil. t.* 84.

Obs. This genus represents the simplest form of ferns—the fronds being so very small and narrow, that no lateral veins are produced; the whole structure being supported by the midrib.

2. PLEUROGRAMMA. *Presl. J. Sm.*

(Tænitidis *sp. Kaulf. Hook. Grev.*

Veins simple, sterile.—*Costa* sporangiferous longitudinally on its sides, forming two continuous, linear, costal *sori,* which become confluent.—Fronds 3 *to* 6 *inches high, linear, simple or forked, veins sometimes obsolete in the upper or fertile portion of the frond.*

Examp. 1. P. *linearis.—Illust. Hook. et Grev. Ic. Fil. t.* 77. *Hook. Gen. Fil. t.* 72 *& t.* 75. *A.*

Obs. Differing from *Monogramma* by the presence of lateral veins, and in the sporangia, being produced in a line on each side of, and close to, the midrib.

3 Grammitis. *Sw.*

(Xiphopteris. *Kaulf.* Micropteris. *Desv.*)

Veins simple or forked, internal. *Sporangia* lateral. *Sori* oval, oblong, oblique.—Fronds *simple, margin entire or serrulate, plane or the apex concave, the soriferous venule sometimes very short, or dentiform and conniving with the costa.*

Examp. 1. G. linearis. *Sw.* 2. G. marginella. *Sw.* 3. G. australis. R. Br. 4. G. serrulata *Sw.—Illust. Schk. Crypt. t.* 7. *Hook. Grev. Ic. Fil. t.* 62. *Hook. gen. fil. t.* 82. *B.*

Obs. Distinguished from the last genus by the sori being produced on the lateral veins, and therefore oblique to the midrib; but in more than one species the soriferous venule is very short, and consequently the sori connive and appear to be parallel to the midrib. The oblong sori of *Grammitis* is the only character that distinguishes it from a number of species of the first section of the following genus *Polypodium*, their habit being similar; and I have great doubts in which genus many of the species of *Grammitis* of Blume should be placed.

4. Polypodium. *Linn. J. Sm.*

(Adenophorus. *Gaud.* Prosaptia. *Presl.* Marginaria. *Bory.* Davalliæ sp. *Sw. Hook. Grev.*)

Veins simple, forked or pinnate, free. *Sporangia* terminal or lateral, superficial or sometimes immersed. *Sori* round, rarely oval or oblong, transverse—uniserial, solitary or irregular.—Rhizoma *creeping, sometimes cæspitose.* Fronds *ranging from a few inches to* 3 *or* 4 *feet high; and from simple to decompound, multifid, coriaceous or membraneous, smooth, villose or glandulose.* Sporangia *sometimes seated in a deep cyst or cavity, which forms elevated protuberances on the upper side of the frond.*

Obs. This genus, as now characterized, still contains about 100 species, which vary much in habit and in the division of their fronds. In a few species the sporangia are seated in a deep cyst-like cavity, out of which they protrude. In *Polypodium contiguum* (Davallia *Sw.*) and a few other species, this cavity is formed nearly vertical with the direction of the vein; and, being open exteriorly, forms with the margin a cup-like indusium, not much unlike the urceolate indusium of *Davallia*, which form constitutes the genus *Prosaptia* of Presl. In two species from Java, and one from Ceylon, the cavity is oblong, and slit in the direction of the vein; and in one of the Java species, its margin is beset with rigid hairs; but according to my view these forms cannot be considered otherwise than as characterizing a small group of *Polypodium.* The genus *Adenophorus* of Gaudichaud is formed from three or four small species, having a rigid habit, and thickly covered with clavate pellucid glands; and bearing a solitary terminal sorus on each lacinia—but similar glands and solitary sori are common to other species of *Polypodium* with large decompound flaccid fronds.

* CTENOPTERIS. *Blume. J. Sm.*

Fronds linear, entire, sinuose or pinnatifid, pinnate or bipinnatifid. Sori terminal, rarely subterminal.

Examp. 1. P. obliquatum. *Blume.* 2. P. celebicum. *Blume.* 3. P. contiguum. *J. Sm.* (Davallia. *Sw.*) 4. P. trichomanoides. *Sw.* 5. P. pendulum. *Sw.* 6. *P.* papillosum. *Blume.* 7. P. vulgare. *L. P.* tamariscinum. *Kaulf.*—Illust. *Hook. et Grev. Ic. Fil. t.* 105, 108, 141, 174, 223.

** PHEGOPTERIS. *Presl. J. Sm.*

Fronds usually large, varying from pinnate to decompound. Sori lateral or nearly terminal, sporangia sometimes echinate.

Examp. 8. P. Phegopteris. *Linn.* 9. P. Dryopteris. *Linn.* 10. P. effusum. *Sw.* 11. P. divergens. *Jacq.* 12. P. rugulosum. *Lab.*—Illust. *Schk. Crypt. t.* 20. 20 b. *Hook. et Grev. Ic. Fil. t.* 66, 210. *Hook. Gen. Fil. t.* 69. B.

5. STRUTHIOPTERIS. *Willd.*

Fertile fronds contracted, their margins revolute, conniving, forming a universal *indusium*. *Veins* pinnate, free. *Sporangia* lateral, base of the pedicels concrete, forming an elevated, thickened receptacle. *Sori* round, confluent.—Rhizoma *cæspitose.*—Fronds 2 *to* 3 *feet high, bipinnatifid, the fertile pinnæ linear, revolute, moniliform, each laciniæ producing five soriferous veins, the margin becoming replicate, and lacerated, and then totally occupied by the confluent sori.*

Species 1. S. germanica. *Willd.* 2. S. Pennsylvanica. *Willd.* —Illust. *Schk. Crypt. t.* 105. *Hook. gen. fil. t.* 69. A.

Obs. The form and position of the sori of this genus does not differ from some species of *Polypodium*, but the whole habit indicates its being distinct.

6. CERATODACTYLIS. *J. Sm.*

(Allosorus sp. *Kunze.*)

Fertile pinnules contracted, margin abruptly reflexed, membraneous, conniving, forming a universal *indusium; veins* forked, free. *Sporangia* lateral. *Sori* linear, forked, oblique.

Rhizoma—? Fronds *stipitate,* 2½ *feet high, smooth, tripinnate, the upper portion contracted, forming linear fertile* pinnules; *sterile* pinnules *alternate, oblong-elliptical, oblique at their base.* Veins *twice dichotomously branched, their apices exserted, forming hooked serratures.*

Species. C. osmundioides. *J. Sm.* (Allosorus Karwinskii *Kunze.*)—Illust. *Hook. et Bauer's Gen. Fil. t.* 36.

Obs. The solitary species upon which this genus is founded is a native of Mexico. In habit the sterile portion of the frond is like *Osmunda,* and the fertile pinnules have some analogy to *Ceratopteris*, while the position of the sporangia and form of the sori agree with *Gymnogramma;* and differ from the following genus more by its distinct habit and gigantic size than in any real technical difference, except that the sporangia of *Ceratodactylis* occupy a greater length of the vein than in *Allosorus.*

7. ALLOSORUS, *Bernh. J. Sm.*

(Pteridis sp. *Linn. Sw.* Phorolobi sp. *Desv.* Cryptogramma *R. Br.*)

Fertile fronds contracted, margins revolute, conniving, forming a universal *indusium. Veins* forked, free. *Sporangia* terminal. *Sori* round or oblong, laterally confluent, forming a broad, intramarginal, compound, transverse *sorus.*

Rhizoma *creeping, somewhat cæspitose.* Fronds *bi-tripinnate or decompound, generally smooth.* Sterile pinnules, *dentate, crenate or laciniate.* Fertile segments *oval or oblong, elliptical, revolute and plaited.* Veins *elevated, terminating within the indusiiform margin, usually both branches sporangiferous.* Sporangia *confluent, ultimately occupying the whole under surface.*

Species. 1. A. crispus. *Bernh.* 2. A. acrostichoides, *Spreng.* 3. A. Brunonianus (Cryptogramma. *Wall.*) 4. A. gracilis. *J. Sm.* (Cheilanthes. *Kaulf.*) 5. A. ciliatus. *Presl.* 6. A. hirsutus. *Presl.*—Illust. *Schk. Crypt. t. Hook. et Grev. Ic. Fil. t.* 29, 158.

Obs. From the circumstance of the species of this genus having the margin of their fronds membranaceous and indusiiform, and also by the sori being confluent, forming as it were a transverse marginal sorus; they have, on that account, been placed in, or near to *Pteris;* but as the indusiiform margin is formed by the changed state of the fertile frond, and does not rise from a sporangiferous receptacle as in true *Pterideæ;* I consider therefore *Allosorus* to be more naturally placed near *Polypodium,* from which it differs more by the contracted character of the fertile fronds, than in the position or form of the sori.

8. JAMESONIA, *Hook. Grev.*

(Pteridis sp. *Sw.* Allosori sp. *Presl.*)

Veins radiating, free. *Sporangia* medial. *Sori* round, crinite, 3 to 5 confluent, forming one central, compound, round *sorus* (to each pinne), the margin of which is revolute and conniving, forming a universal *indusium.*—Fronds *linear from 6 to 12 inches high, pinnate.* Rachis *thickly covered with long articulated hairs, pinnæ reniform, cordate, imbricate, concave.*

Species. J. imbricata, *Hook. et Grev.*

Bauer's illust. gen. fil. t. 13. Hook. Grev. ic. fil. t. 178.

Obs. This genus is founded upon a solitary species, which on account of the pinnæ having an indusiiform margin, has led it to be considered as a species of *Pteris;* but, as in the preceding genus, the position of the sporangia and free veins show it to belong to *Polypodieæ.* In the character and figure given in the *Icones filicum,* it is made to appear as having only one sorus, but on examination it appears that there are usually five sporangiferous points, which, by being produced very close to each other soon become confluent, and then appear like one sorus.

9. NOTHOLÆNA. *R. Br. J. Sm.*

(Pteridis sp. *Sw.* Cheilanthis. sp. *Sw.* Cincinnalis. *Desv.*)

Veins forked or pinnate. *Venules* free. *Sporangia* terminal. *Sori* round, solitary or laterally confluent, forming a linear, continuous or interrupted, compound, marginal *sorus.*—Rhizoma *cæspitose.* Fronds *pinnate or bi-tripinnate, pilose, or densely squamose, tomentose or farinose, through which the* sporangia *protrude and which are usually few to each* sorus; *margin sometimes slightly reflexed (indusiiform).*

* ARGYROCHOSMA. *J. Sm.* Fronds covered with a white, farinose powder on their under surface.

Examp. 1. N. argyrostigma. *J. Sm.* 2. N. trichomanoides. *R. Br.* 3. N. nivea. *Desv.* 4. N. tenera, *Hook.*

** ERIOCHOSMA. *J. Sm.* *Fronds* densely tomentose. 5. N. rufa. *Presl.* 6. N. lanuginosa. *Desv.* 7. N. hypoleuca. *Kunz.* 8. N. distans. *R. Br.* 9. N. vestita. *J. Sm.* (Cheilanthes. *Sw.*) 10. N. hirta. *J. Sm.* (Cheilanthes. *Sw.*) 11. N. sulcata. *Link.* 12. N. tomentosa. *Desv.* 13. N. *stellapilis. J. Sm.*

*** LEPICHOSMA. *J. Sm.* *Fronds* densely squamose. 14. N. sinuata. *Kaulf.* 15. N. Marantæ. *R. Br.* 16. N. myriophylla. *J. Sm.* (Cheilanthes. *Hook.*) 17. N. lentigera. *J. Sm.* (Cheilanthes. *Sw.*)—Illust. *Schk. Crypt. t.* 99. *Hook. Gen. Fil. t.* 76. A.

Obs. The pilose and farinose habits of several species of this genus, indicate their affinity with the following genus *Gymnogramma;* but that genus differs in having linear, oblique sori. The terminal sori and free veins also indicate its affinity with *Polypodium*, but in *Notholæna* the sori are usually confluent, forming, as it were, a linear, marginal sorus, which, in conjunction with the slightly reflexed indusiiform margin, distinguishes it from *Polypodium*; but the latter character strongly indicates some relationship with *Cheilanthes* and *Cassebeera* in *Pterideæ*, with which genera *Notholæna* has much affinity in habit.

10. Gymnogramma. *Desv.*

(Acrostichi sp. *Linn.* Grammitidis sp. *Sw.* and *Authors.*) *Veins* forked, free. *Sporangia* medial. *Sori* linear, forked, oblique, becoming confluent.—Rhizoma *cæspitose.* Fronds *simple, pinnate, bipinnate or decompound, smooth, villose, or farinose, from a few inches to 2 or 3 feet in length.* Sporangia *usually occupying nearly the whole length of the venules.*

* *Fronds villose or glandulose.*

Examp. 1. G. vestita. *Wall. Hook.* 2. G. rufa. *Desv.* 3. G. tomentosa. *Desv.* 4. G. rutæfolia. *Hook.* 5. G. filipendulæfolia. *Desv.*

** *Fronds farinose or glabrous.*

6. G. falcata. *J. Sm.* (Hemionitis falcata. *Hamilt.*) 7. G. Javanica. *Blume.* 8. G. trifoliata. *Desv.* 9. G. Peruviana. *Desv.* 10. G. calomelanos. *Kaulf.* 11. G. chrysophylla. *Kaulf.* 12. G. chærophylla. *Desv.*—Illust. *Bauer's Gen. Fil. t.* 37. *Blume Fl. Jav. t.* 41, 42.

Obs. There can be no doubt but that there is great affinity between some species of this genus and *Hemionitis,* which genus is characterized with reticulated veins; but if *Hemionitis* were to be placed here, then a train of other genera would have to follow, which more naturally agree with succeeding genera, and which could not with propriety be placed near *Gymnogramma.*

11. Leptogramma. *J. Sm.*

(Grammitidis sp. *Presl.* Gymnogrammatidis sp. of *Auth.* Polypodium § Pleurogramma. *R. Br.*)

Veins costæform, pinnate; *venules* parallel, free. *Sporangia* medial. *Sori* oblong-linear, simple, oblique.—Rhizoma *creeping or somewhat cæspitose.* Fronds *bipinnatifid, 1 to 2½ feet in length, smooth or villose.* Veins *usually external.* Sori *composed of few sporangia, which are sometimes echinate.*

Examp. 1. L. asplenioides. (*Sw.**) 2. L. totta. (*Schlecht.*) 3. L. Lovei. (*Hook.*) 4. L. villosa. (*Link.*) 5. L. polypodioides. (*Spreng.*) 6. L. Linkiana. (*Presl.*) 7. L. gracile. (*Hew.*)—Illust. *Hook. et Grev. Ic. Fil. t.* 89.

Obs. This genus agrees in habit with many species of *Polypodium*, and is distinguished by having linear sori, but in one or two of the species the sori are scarcely more than oblong. With *Grammitis* it agrees in the form of the sori, but differs totally in habit from those species which I now retain as true Grammitis. Its simple sori distinguish it from *Gymnogramma*.

SECT. II.—SYMPLOPHLEBIEÆ. *J. Sm.*

Venation variously anastomosed or reticulated.

12. STENOSEMIA. *Presl. J. Sm.*

(Acrostichi sp. *Sw.* Polybotryæ sp. *Blume.*)

Veins costæform, pinnate. *Venules* simple or forked, the lower opposite pairs and their branches angularly anastomosing, the others free; the *fertile ones* usually less anastomosed, sometimes all free. *Sporangia* terminal or medial, round or linear, distinct or confluent in pairs, or somewhat amorphous. —Fronds 1 *to* 2 *feet high, bipinnatifid.* Stipes *ebeneous, laciniæ obtuse, entire, or the lower ones slightly laciniated, axis of the pinnæ often gemmiferous.* Fertile fronds *often imperfectly developed, constituting rachiform sporangiferous spikes.*

Species. S. aurita. *Presl.—Illust. Blume Fl. Jav. t.* 1.

Obs. This Fern has hitherto been placed in the tribe *Acrosticheæ;* and Presl has characterized it as a genus distinct from *Polybotrya* by its anastomosing veins; but on examining specimens collected in the Philippine islands by Mr Cuming, it appears evident that all former descriptions and figures of the fertile fronds, have been taken from starved or imperfectly developed fronds, which appear as if contracted, and, being sporangiferous, give to it the appearance of an *Acrostichum,* as exhibited by the figures in *Runph. Amb. vol.* 6. *t.* 35. *f.* 1, and Blume's *Fl. Java. vol.* 3. *t.* 1. But, besides these forms, there are specimens of evidently the same Fern, in which the fertile fronds are in the usual state, or but slightly contracted, a character common to all fertile fronds of Ferns, which have sterile and fertile ones distinct. In these fronds the sori are distinct as in *Polypodium*, but differing from that genus by its anastomosing venules, which, in that respect, as also in the character of the lower sori, it has great affinity with *Meniscium* and *Goniopteris,* and appears to form a transition between these genera and those species of *Acrosticheæ* which I have in the following pages characterized under *Cyrtogonium.*

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* The authority for the specific names being in a parenthesis, denotes that such species stood formerly under one or other of the genera given as synonymes.

13. STEGNOGRAMMA. *Blume. Presl.*

Veins costæform, pinnate, each opposite pair of venules angularly anastomosing, and producing from their junction an excurrent usually sterile veinlet, which anastomoses in the junction of the next superior pair. *Sporangia* medial. *Sori* oblong or linear, simple or continuous.—Rhizoma ——? Fronds *from* 1 *to* 2 *feet in length, pinnate; pinnæ crenate.* Sporangia *echinate, occupying the middle portion of the venules, and sometimes continued across their junction, and occupying the excurrent veinlet.*

Species. 1. S. aspidioides. *Blume.*—Illust. *Blume, Fl. Jav. t.* 44.

Obs. This genus is distinguished from the preceding by the venules being anastomosed, and from the following, by the linear straight sori, and the excurrent veinlet being also anastomosed.

14. MENISCIUM. *Schreb.*

Veins costæform, pinnate, each opposite pair of venules angularly or arcuately anastomosing, and producing from their junction an excurrent sterile free veinlet. *Sporangia* medial—terminal, continued across the junction of the venules, forming linear, arcuate somewhat transverse *sori.*—Rhizoma *creeping.*

Fronds *pinnate, pinnæ entire or crenate.* Veins *straight, parallel,* the excurrent veinlet rarely fertile. *Sporangia* sometimes echinate. *Sori* becoming confluent.

Species. 1. M. triphyllum. *Sw.* 2. M. angustifolium. *Willd.* 3. M. serratum. *Cav.* 4. M. dentatum. *Presl.* 5. M. arborescens. *Humb.* 6. M. reticulatum. *Sw.* 7. M. cuspidatum. *Blume.*—Illust. *Bauer's Gen. Fil. t.* 40. *Schott. Gen. Fil. t.* 14.

Obs. The transverse, arched, or crescent-shaped sori, readily distinguish this genus; but, on comparing the position of the sporangia with the following genus, it will be seen that it differs only by the sporangiferous receptacle of *Meniscium* being continued across the angular meeting of the venules, forming a curved sorus, which may be viewed as being formed by the union of two terminal sori: whereas in the next genus the sori are round, and at some distance below the junction of the venules.

15. GONIOPTERIS. *Presl, J. Sm.*

(Polypodii sp. *Sw.* and *Authors.*)

Veins costæform, pinnate, the lower, opposite pair (or more pairs) angularly anastomosing, producing from their junction an excurrent, free, or anastomosed sterile veinlet. *Sporangia* medial or costal. *Sori* round.—Rhizoma *creeping.* Fronds *pinnate; pinnæ entire, serrate or pinnatifid; when deeply pinnatifid only the lower pair of venules anastomose, the rest free.* Sori *generally seated on or near the middle of the venules or subterminal or basal.* Sporangia *often echinate.*

Examp. 1. G. prolifera (Meniscium. *Sw.*) 2. G. costata. *Wall.* 3. G. urophylla. *Wall.* 4. G. crenata. *Sw.* 5. G. aspera. *Roxb.* 6. G. pennigera. *Forst.*—Illust. *Bauer's Gen. Fil. t.* 38.

Obs. Distinguished from *Stegnogramma* by the sori being round. It is necessary here to remark that the technical character which distinguishes the tribe *Aspidieæ* from *Polypodieæ* rests entirely on the sori of the former being furnished with a special indusium, which in many cases is often very fugacious, or so small that it soon becomes obliterated by the enlargement of the sporangia; and, as both these tribes contain genera analogous in habit, venation, form and position of the sori, it becomes difficult, in the absence of the indusium, to determine in which tribe those species so circumstanced should be placed. From much observation it appears to me that many species described as belonging to *Polypodieæ* are true *Aspidieæ*, particularly among those hitherto placed in the genus *Polypodium* and *Goniopteris;* these two genera being analogous to *Lastrea* and *Nephrodium* in *Aspidieæ.*

16. SYNAMMIA. *Presl. J. Sm.*

(Polypodii sp. *Cav.*)

Veins pinnately forked, the lower exterior *venule* free and fertile, the others angularly anastomosing, forming a row of elongated oblique areoles. *Sporangia* terminal. *Sori* oblong-linear, oblique, transversely uniserial.—Fronds 8 *to* 12 *inches high, pinnate, pinnæ sessile, adnate, entire, crenate or sinuose or lobed.* Sporangia *occupying the upper part of the free venules, terminating in the costal areoles.*

Species. S. triloba. *Presl.*

Obs. This approaches *Grammitis* both in texture and form of the sori, but differs in having anastomose veins. It is evidently allied to that genus, through such species as *Polypodium grammitidis.* Presl has also placed under *Synammia* the *Grammitis elongata* of Swartz; but that fern differs from *Synammia triloba* not only in habit but also in venation. I have removed it to the genus *Phlebodium.*

17. GONIOPHLEBIUM. *Presl. J. Sm.*

(Polypodii sp. *Auth.* Marginaria. *Presl.*)

Veins forked or costæform and pinnate, the lower exterior *venule* free and fertile, the others angularly anastomosing and producing from their junction an excurrent, free, generally fertile veinlet. *Sporangia* terminal. *Sori* round, naked or squamiferous, arranged in one or more transverse parallel rows.—Rhizoma *creeping.* Fronds *simple, pinnatifid or* *pinnate, the fertile sometimes contracted, the pinnæ more or less distinctly articulated with the rachis, smooth, villose or densely covered with scales, through which the sporangia protrude.*

Obs. This genus is readily distinguished from *Goniopteris* by the sori being always produced on the apex of the lower venule, or on the excurrent free veinlets which terminate in the areoles; the latter are often sterile or absent:—then only the costal areoles are soriferous and consequently they form only one transverse row of sori. The peculiarities of habit of the species forming this genus, admit of their being arranged under several sections which may, with no great impropriety, be considered as genera.

* LOPHOLEPIS. *J. Sm.*

Rhizoma filiform. ***Fronds*** 1 to 4 inches high, squamose, the fertile contracted. ***Sori*** uniserial, each furnished with a dense tuft of elongated scales.

Examp. 1. G. piloselloides. *(Linn.)* 2. G. ciliatum. *(Willd.)* 3. G. tectum. *(Kaulf.)*—Illust. *Bauer's gen. fil. t.* 51.

** LEPICYSTIS. *J. Sm.*

Rhizoma slender. ***Fronds*** linear, pinnatifid, from 3 to 18 inches high, densely covered with round or elongated scales, through which the sporangia protrude, the scales forming a calyciform indusium. *Sori* uniserial.

Examp. 4. G. incanum. (Sw.) 5. G. sepultum. *(Kaulf.)* 6. G. Tweedianum. *(Hook.)* 7. G. macrocarpum. *(Presl.)* (Pleopeltis pinnatifida, *Hook. Grev.*)—Illust. *Schk. Crypt. t.* 11. *b.*

Obs. The venation of this group is difficult to be seen, but the species are readily known by their squamose habit.

*** SCHELLOLEPIS. *J. Sm.*

Rhizoma thick. ***Fronds*** 2 to 3 feet high, linear-pinnatifid, or deltoid and pinnate, smooth. ***Sori*** uniserial, each furnished with numerous, small, laciniated, shining scales.

Examp. 8. G. lachnopus (*Wall.*) 9. G. amœnum (*Wall.*) 10. G. argutum (*Wall.*) 11. G. verrucosum (*Wall.*)—Illust. *Bauer's gen. fil. t.* 14.

**** GONIOPHLEBIÆ veræ.

Rhizoma thick. *Fronds* 2 to 4 feet high, usually smooth, simple, pinnatifid or pinnate. *Sori* naked, uniserial, or multiserial.

Examp. 12. G. pectinatum. (*Linn.*) 13. G. attenuatum. (*Humb.*) 14. G. neriifolium. (*Sw.*) 15. G. dissimile. (*Linn.*) Illust. *Hook. gen. fil. t.* 70. B.

18. NIPHOBOLUS. *Kaulf.*

Veins obscure, or evident, and costæform; venules transversely anastomosing, producing on their exterior side two or more excurrent free veinlets, which are sporangiferous on their apices. *Sori* round, protruding through dense, stellated pubescence.—Rhizoma *creeping or cæspitose.* Fronds *varying from a few inches to 2 feet long, the fertile often contracted, simple, linear-lanceolate, thick and fleshy or coriaceous, covered with stellated, sessile or pedicellate scales or tomentum, rarely smooth.* Veins (*when evident*) *parallel, combined by transverse parallel venules, forming rhomboidal areoles, each containing 2 to 5 or more soriferous veinlets, forming many parallel transverse rows of sori between the costæform veins; or the sori are irregular and usually confluent.*

* *Repenteæ.*

Rhizoma creeping. *Fertile fronds* contracted and fleshy; venation obscure. *Sori* irregular.

Examp. 1. N. rupestris; *Spreng.* 2. N. pertusus; *Spreng.* 3. N. bicolor; *Kaulf.* 4. N. glaber; *Kaulf.* 5. N. lingua; (Polypodium, *Thunb.*) *Illust. Hook. et Grev. ic. fil. t.* 44, 93. *Hook. ex. fl. t.* 162.

** *Cæspitoseæ.*

Rhizoma cæspitose. *Fronds* uniform, coriaceous. *Veins* evident, costæform.

Examp. 6. N. flocculosus; *Spreng.* 7. N. costatus; *Presl.* 8. N. splendens; *J. Sm.*—*Illust. Blume Fl. Jav. t.* 20 to 27.

Obs. The dense stellated scales or pubescence which accompanies the soriferous portion (or the whole frond), will distinguish this genus from all other *Polypodieæ;* and which it is the more necessary to observe, because on account of the thick texture of the fronds, the venation is difficult to be seen. In one species (*N. sphærocephalus*,) the sori are large, of an oval form, and arranged in one transverse row, which structure might induce us to consider that species as belonging to the subsequent genus *Drynaria;* but, after a careful examination of its venation, I am induced to retain it here.

19. Cyrtophlebium, *R. Br.*

(Polypodii sp. *Auth.* Campyloneurum. *Presl.*)

Veins forked or costæform and pinnate, the lower exterior venule (of each fascicle) free and fertile, the others arcuately or angularly anastomosing, producing on their exterior side two or more excurrent, free, fertile veinlets. *Sporangia* lateral, or sometimes terminal. *Sori* round, naked, arranged in two rows, between, and parallel with, the costæform veins, or irregular. Fronds *simple, pinnatifid or pinnate, smooth, the excurrent veinlets sometimes anastomosing with the next superior venule, forming two rows of areoles between each two primary veins, fertile veinlets sometimes very short.*

Examp. 1. C. repens; (*Sw.*) 2. C. Phyllitidis; (*Linn.*) 3. C. nitidum; (*Kaulf.*) 4. C. decurrens; (*Radd.*)—*Illust. Hook. Gen. fil. ined.*

Obs. The smooth fronds and distinct sori readily distinguish this genus from the preceding. In habit, the species agree with a group belonging to the subsequent genus *Drynaria*, but which is characterized by a more complex anastomosing of the veins.

20. Phlebodium, *R. Br. J. Sm.*

(Polypodii *sp. Auth.* Pleopeltidiæ *sp. Humb. Hook.* Pleopeltis. *Presl.* Synammiæ *sp. Presl.*)

Veins pinnate or variously branched; the *venules* arcuately or angularly anastomosing, producing on their exterior side or angular meetings, two (rarely more) conniving or transversely combined veinlets which are sporangiferous on their combined apices or line of junction. *Sori* round, oval or rarely oblong-linear, transversely uniserial, or multiserial.—Fronds *simple, entire, pinnatifid or pinnate, membranous or coriaceous, smooth or squamiferous.* Sori *sometimes more obviously arranged in oblique rows, between each two of the primary veins.*

* PLEOPELTIS.

Fronds generally coriaceous and squamiferous. *Veins* usually internal. *Sori* uniserial, often oval, or oblong and large, and at first covered with the scales of the frond.

Examp. 1. P. lanceolatum; (*Linn.*) 2. P. salicifolium; (*Willd.*) 3. P. serpens; (*Linn.*) 4. P. percussum; (*Cav.*) 5. P. macrocarpum; (*Willd.*) 6. P. elongatum; (Grammitis, *Sw.*) 7. P. angustum; (Pleopeltis, *Humb.*) 8. P. *ensiforme;* (*Thunb.*).

** PHLEBODIUM VERUM.

Fronds usually large, pinnatifid or pinnate, smooth, or glaucous. *Veins* external. *Sori* transversely uniserial or multiserial, round.

Examp. 9. P. aureum; (*Linn.*) 10. P. decumanum; (*Willd.*) 11. P. areolatum; (*Willd.*) 12. P. latum; (*J. Sm.*) —*Illust. Schk. Crypt. t. 7. Hook. gen. fil. ined.*

Obs. The habit of a few of the species of this genus is analogous to *Goniophlebium*, but from which *Phlebodium* differs by having the lower venules combined, and the costal areole therefore sterile, the sori being produced on the apex or confluent point of two veinlets which terminate in the exterior rows of areoles, each areole producing a single sorus.

In *Phlebodium elongatum*, and another undescribed species, the fertile areoles are lengthened transversely as also the sori, which latter is to be accounted for by the fertile veinlets being distant and connected by an elongated sporangiferous receptacle, which structure presents a very marked character, but as their habit does not differ from others of that section, and which also have a tendency to produce oblong sori, they cannot with propriety be separated.

This genus, as now characterized, contains the original and other species of the genus *Pleopeltis* of authors, which depended for its character as a genus entirely on the sori being furnished with numerous scales similar to an indusium, but as these scales are common to the whole surface of the frond, they therefore, according to my view, cannot be considered of generic value alone; but as the species which I have placed under the section *Pleopeltis* are of a different habit from what I have termed true *Phlebodium*, it might therefore be no great impropriety in considering them as two distinct genera. In some few of the species of the first section, the soriferous veinlets are sometimes very short or come from nearly the opposite sides of the areole, which gives an appearance as if the sori were seated on the angular anastomose of the venules, similar to the following genus, with which they have other points of affinity.

21. DRYNARIA. *Bory. R. Br. J. Sm.*

(Polypodii sp. *Auth.* Dipteris. *Reinw.* Phymatodes. *Presl.* Microsorum. *Link.* Anaxetum. *Schott.*)

Veins usually costæform, parallel or flexuose. *Venules* compound anastomosing, producing from their sides variously directed, free, usually sterile *veinlets*, which terminate within the areoles. *Sporangia* produced on the angles or points of confluence of (generally) numerous veinlets. *Sori* round or sometimes oblong, transversely uniserial, or in one or two oblique rows between each two of the primary veins, or irregular.—Fronds *from a few inches to two or three feet long, membranous or coriaceous, smooth, simple, entire, pinnatifid or pinnate, pinnæ usually articulated with the rachis.* Sori *naked or squamiferous, superficial or deeply immersed, forming protuberances on the superior side of the frond.*

Obs. This extensive genus differs from the preceding by the more compound and zigzag anastomose branching of the venation, and by the sori being produced on the angles or points of meeting of generally numerous venules; and although the species agree tolerably well, as regards that character, yet there are some striking peculiarities in habit and disposition of the sori, which have induced me to arrange them under the following sections, that may be considered as nearly equivalent to genera.

* PHYMATODES. *J. Sm.*

Fronds simple, pinnatifid or pinnate. *Sori* round, rarely oblong, or by confluence, linear, often immersed, transversely uni- or rarely biserial.

Examp. 1. D. loriforme; (*Wall.*) 2. D. normale; (*Don.*) 3. D. stenophylla; (*Blume.*) 4. D. pustulata; (*Forst.*) 5. D. vulgare; (*J. Sm.*) (Poly. phymatodes, *Linn.*) 6. D. leiorhiza; (*Wall.*)—*Illust. Schk. Crypt. t.* 10. *Hook. et Grev. Ic. Fil. t.* 209.

** DIPTERIS. (*Reinw.*)

Fronds simple, entire, linear lanceolate, or bipartite and digitate, rarely cordate. *Sori* round or rarely oval, superficial, in one or two rows between the primary veins, or irregular and numerous.

Examp. 7. D. Horsfieldii; (*R. Br.*) 8. D. Wallichii; (*R. Br.*) 9. D. spectrum; (*Kaulf.*) 10. D. plantaginea; (*Willd.*) 11. D. crassifolia; (*Linn.*) 12. D. hemionitidea; (*Wall.*)—*Illust. Hook. et Grev. Ic. Fil. t.* 125. *Horsfield's Fl. Jav. t.* 1. *Bauer's gen. fil. t.* 29. *Schott. gen. fil. t.* 1.

*** DRYNARIA *vera. Bory.*

Fronds rigid, of two forms, the sterile sessile oblong-cordate, sinuose or laciniated, the vascular structure rigid and permanent, fertile fronds two to three feet long, pinnatifid or pinnate. The pinnæ articulated with the rachis. *Sori* round, in one or two rows between, and parallel with the primary veins or transversely uniserial.

Examp. 13. D. quercifolia; (*Bory. Linn.*) 14. D. coronans; (*Wall.*) 15. D. propinqua; (*Wall.*) 16. D. diversifolia; (*R. Br.*)

22. DRYOSTACHIUM, *J. Sm.*

Veins (of sterile segments) costæform; *venules* compound, anastomosing, forming nearly equal quadrangular areoles, and producing from their sides variously directed free veinlets, fertile segments terminal, contracted, entire, plain, sporangiferous; *veinlets* confluent, forming a large oblong or quadrangular sorus between each two of the nearly obsolete costæform veins, arranged in a transverse row, nearly confluent. Fronds *sessile, rigid, one to three feet long, simple, or usually pinnatifid and sterile below, and pinnate and fertile above, the pinnæ sessile and articulated with the rachis,* 6—10 *inches long, tesselated, the areas of which are wholly occupied by the sporangia, which are smooth or pilose.*

Species. 1. D. caudatum; (Polypodium, *Reinw.*) 2. D. splendens; *J. Sm.—Journ. of Bot. p.* 399. 3. D. pilosum; *J. Sm. loc. cit.—Illust. Hook. gen. fil. ined.*

Obs. The first mentioned species of this genus is a native of the Celebes, and the other two are from the island of Luzon, growing on trees, agreeing in habit with *Drynaria quercifolia* and *D. coronans*, but differing by the fertile portion of their fronds being contracted into rachiform segments bearing remarkably large sori, which two characters must be viewed as the only technical distinction between *Dryostachium* and *Drynaria.*

23. AGLAOMORPHA. *Schott.*

(Psygmium. *Presl.*)

Veins (of sterile segments) costæform; *venules* compound, anastomosing, forming nearly equal quadrangular areoles, and producing from their sides variously directed free veinlets, fertile segments terminal, contracted, sinuously-pinnatifid; sporangiferous veinlets confluent, obsolete, forming a round, small, depressed sorus on each lobule of the segments, arranged in a transverse row.—Fronds *sessile, rigid, two to three feet long, pinnatifid and sterile below, and pinnate and fertile above, the pinnæ sessile and articulated with the rachis,* *linear,* 10 *inches long, sinuously-pinnatifid, lobules rounded, distant, each bearing a small round sorus.*

Species. A. Meyeniana; *Schott.* (Psygmium elegans; *Presl.*) —*Illust. Schott. gen. fil. t.* 19.

Obs. This singular-looking fern is also a native of Luzon, and has the same habit and character of venation as *Dryostachium* from which it differs only by its small distant sori.

Although it appears very probable that Schott and Presl have drawn up their respective characters of this genus from the same specimen, yet they differ from each other, and from my observations. This has no doubt arisen from the very obscure state of the fertile venules; but by a careful examination, it will be seen that the sporangia are not produced either on the apex of a free venule, (as stated by Presl,) or on the confluent apices of two outwardly directed venules, (as stated by Schott,) but are produced on the confluence of several venules as in the two preceding genera, and agreeably to what might be expected by the structure of the sterile venation, and therefore *Aglaomorpha,* like *Dryostachium,* is not so characteristic as a distinct genus, as its singular appearance would lead us to imagine.

24. LECANOPTERIS. *Blume.*

Veins costæform, flexuose. *Venules* compound anastomosing, producing variously directed free sterile veinlets; *sporangiferous venules* confluent, produced on exserted marginal lobules, which are concave, inflexed, and cupuliform, forming large, oval, distant sori. Fronds *linear-lanceolate, pinnatifid,* 6 *to* 10 *inches long, laciniæ elliptical; the lower ones entire and sterile, the superior ones sinuously lobed, each lobe becoming reflexed, and bearing a single sorus.*

Species. L. Carnosa; *Blume.*

Obs. The species upon which this genus is founded agrees in venation and its soriferous lobes with *Aglaomorpha,* but it is distinct in its general aspect. The circumstance of the sori being produced on projecting lobes, which are concave and indusiiform, may not unaptly be compared to the sori of

Dicksonia; and therefore may be considered to bear the same analogy in the structure of its sori to that genus as *Polypodium contiguum* does to *Davallia.*

25. DICTYOPTERIS. *Presl.*

Polypodii sp. *Auth.*

Venation uniform, internal, reticulated. *Sporangia* produced on the confluence of the venules, or medial. *Sori* round, rarely oblong, transverse, uniserial or irregular. Fronds *entire, linear-lanceolate or deltoid and bipinnate; smooth, coriaceous.* Pinnæ *sinuose or pinnatifid.*

Species 1. lanceolata; (Grammitis; *Cunn.*) 2. D. attenuata; (*R. Br.*) 3. D. macrodonta; (*Reinw.*) 4. D. pteroides; (*Presl.*)

Illust. Hook. Gen. fil. t. ined.

Obs. This genus is distinguished from *Drynaria* and its associates, by having no irregular, free veinlets, terminating in the areoles, the whole ramifications of the veins anastomosing.

26. LOXOGRAMMA. *Presl. J. Sm.*

(Grammitidis sp. *Sw.*)

Venation uniform, internal, reticulated. *Sporangia* produced on the elongated sides of the areoles, forming linear, oblique sori. Fronds *simple, linear lanceolate, coriaceous.*

Species. L. lanceolata; (*Sw.*) *Illust. Hook. et Grev. Ic. Fil. t.* 53. *Hook. gen. fil. t. ined.*

Obs. The absence of costæform veins and free veinlets, terminating in the areoles, distinguishes this genus from the following. I formerly considered that *Grammitis involuta* of Don, and *G. flavescens* of Wallich, belonged to this genus; but on a re-examination of specimens, I am induced to place them in *Selliguea.*

27. SELLIGUEA. *Bory. J. Sm.*

Veins costæform. *Venules* compound, anastomosing, producing variously directed, free veinlets. *Sporangia* produced on the crossings of the venules, forming an oblique linear sorus, parallel with and between each two of the costæform veins. Fronds *simple, linear-lanceolate, or rarely pinnatifid, the fertile sometimes slightly contracted.* Sori *oblique, continuous, rarely interrupted, sometimes broad.*

Examp. 1. S. Hamiltoni; *Presl.* (Grammitis, *Wall.*) 2. S. heterocarpa; *Blume.* 3. S. flavescens; (Grammitis, *Wall.*) 4. S. macrophylla; *Blume.* 5. S. pothifolia; (Hemionitis, *Ham. Don,* Grammitis decurrens, *Wall.*) *Illust. Hook. et Grev. Ic. Fil. t.* 5, 6. *Blume, fl. jav. t.* 51, 52, 53.

Obs. Agreeing in habit and venation with some of the simple fronded species of the *Dipteris* section of *Drynaria;* but, in the present genus, the sporangia are produced in a line between the costæform veins, which character may readily be conceived to be formed by a linear confluence of the sporangiferous points of such species as *Drynaria crassifolia, D. hemionitidea,* and some others, and indeed it is difficult to deny some states of *Drynaria hemionitidea* a place in *Selliguea.*

28. DIBLEMMA, *J. Sm.*

Venation uniform, reticulated; areoles unequal, producing simple or brachiate, straight or curved, free, recurrent veinlets. *Sporangia* produced on the transverse marginal anastomosing of the venules, forming a linear, continuous, marginal sorus, and also on the recurrent veinlets forming round or oblong or irregular sori. Fronds *simple, linear-lanceolate, and attenuated,* 18 *inches in length, by about* ½ *an inch in width, slightly repand, and membranaceous.* Sori *formed of but few sporangia.*

Species. D. Samarensis; *J. Sm.—Hook. Jour. of Bot. p.* 399.

Obs. This simple-looking fern has the venation of some species of *Drynaria* and the following genus *Drymoglossum,* and is peculiar in having the simple round sori of *Drynaria* and the compound elongated marginal sorus of *Drymoglossum* on the same fronds. This double character goes some length to prove that the transverse elongated sori of *Tænitis* and its allies are formed by a linear confluence of the sporangiferous points, as noticed under the preceding genus, and which proves the affinity of these genera with *Drynaria.*

29. DRYMOGLOSSUM. *Presl. J. Sm.*

(Pteridis sp. *Linn.* Taenitidis sp. *R. Br.* Pteropsidis sp. *Desv. Presl.* Nothochlænæ sp. *Kaulf.*)

Venation uniform, compound, anastomosing, producing variously directed, free veinlets. *Sporangia* produced on the transverse sides, and junctions of the marginal venules, forming a linear, continuous, transverse marginal or intramarginal sorus.—Fronds *simple, elliptical or lanceolate, coriaceous, the fertile contracted, sometimes soriferous at the apex only.* Sori *pilose or squamiferous.*

Species. 1. D. piloselloides; *Presl.* 2. D. spathulatum; *Presl.* 3. D. carnosum; *J. Sm.* (Niphobolus, *A. Cunn.*) 4. D. lanceolatum; (*Linn.*) *Illust. Schk. crypt. t.* 87. *Hook. gen. fil.*

30. TÆNITIS. *Sw.*

Venation uniform, reticulated, sporangiferous receptacle transverse, elongated, forming a linear, continuous, or interrupted central sorus.—Fronds *pinnate, coriaceous.* Veins *forming oblique elongated areoles, which are crossed transversely by the sporangiferous receptacle.*

Species. T. blechnoides; *Sw.—Illust. Schk. crypt. t.* 6. *Schott. gen. fil. t.* 20. *Hook gen. fil.*

31. PTEROPSIS. *Desv.*

(Pteridis sp. *Linn.* Tænitidis sp. *Willd. Spreng.*)

Venation uniform, reticulated, sporangiferous receptacle produced on the transverse marginal anastomosing of the venules, forming a linear, continuous, marginal sorus.—Fronds *simple, forked or pinnatifid, coriaceous.* Veins *forming elongated areoles.* Sori *rarely interrupted, sometimes occupying the apex of the frond only, which is then slightly contracted.*

Species. 1. P. furcata; *Desv.* 2. P. angustifolia; *Desv.*—*Illust. Hook. et Grev. Ic. Fil. t.* 7. *Hook. gen. fil.*

Obs. Distinguished from *Tænitis* by the sori being produced on the exterior side of the venation, close to the margin.

32. TÆNIOPSIS. *J. Sm.*

(Vittariæ sp. *Auth.* Haplopteridis sp. *Presl.*)

Veins simple, parallel, their apices transversely combined by the sporangiferous receptacle which is immersed in a groove, forming a linear-continuous intramarginal sorus.

Fronds *simple, long and linear, or lanceolate, plane, or the margin revolute.* Venation *obscure, costa indistinct.* Sporangia *seated in a groove, the margins of which are indusiiform.*

Examp. 1. T. revoluta; (*Don.*) 2. T. lineata; (*Sw.*) 3. T. graminifolia; (*Kaulf.*) 4. T. scolopendrina; (Pteris; *Bory, Willd.*) *Illust. Schk. crypt. t.* 101. *b.*

Obs. The veins being simple, and their apices combined near the margin by a continuous anastomosing vein which produces the sporangia, distinguishes this genus from any of the preceding; but from the following it is more difficult to characterize it, on account of their habits being similar, their separation depending entirely on the difference of position of the sori.

33. VITTARIA. *Sm.*

Veins simple, their apices transversely combined by the sporangiferous receptacle, which is immersed in a marginal groove, forming a linear continuous sorus.—Fronds *simple, from a few inches to 2 feet long, linear or lanceolate, plane.* Venation *obscure.* Costa *usually indistinct, the margin slit longitudinally, forming a sporangiferous groove, the margins of which are indusiiform.* Sporangia *vertical.*

Examp. 1. V. zosterifolia; *Willd.* 2. V. ensiformis; *Sw.* 3. V. elongata; *Sw.*—*Illust. Hook. et Grev. Ic. Fil. t.* 187. *Hook. gen. fil. t.* 68. B.

Obs. The circumstance of the margin of the frond being slit longitudinally, forming two narrow laminæ, with the sporangia rising from the base or axis of the slit or groove and pointing outwards, distinguishes this genus from *Tæniopsis*, which is characterized by the sporangia being produced in a similar groove, but which is situated on the disk, within the margin of the frond; and although I have separated *Tæniopsis* from *Vittaria*, chiefly on that character, yet their habits scarcely indicate any distinction.

The simple venation of both *Tæniopsis* and *Vittaria* is scarcely reconcileable with this section of *Polypodieæ*, except in viewing them in connexion with *Pteropsis*, &c., and also with the two following genera, with which they perfectly agree in habit. I am disposed to view them as forming a transition through *Polytænium* to the reticulated venation of *Antrophyum*.

34. POLYTÆNIUM. *Desv.*

(Vittariæ sp. *Willd.* Antrophyi sp. *Kaulf.*)

Venation uniform, elongated, transversely and distinctly anastomosing, forming elongated, linear areoles. *Sporangia* occupying the lengthened, transverse venules, immersed, forming generally three, linear, parallel, continuous sori.—Fronds *simple, linear-lanceolate, coriaceous.* Veins *immersed, obscure, margin of the sporangiferous grooves indusiiform.*

Species. P. lineatum; *Desv.—Illust. Schk. crypt. t.* 101, *b.*

35. ANTROPHYUM. *Kaulf.*

Venation uniform, reticulated, sides of the areoles more or less sporangiferous. *Sporangia* immersed, rarely superficial, forming linear, continuous or interrupted reticulated *sori.*—Fronds *simple, linear-lanceolate or elliptical, coriaceous, with or without a midrib, sporangiferous, grooves indusiiform.*

* COSTATA.

Examp. 1. *A. cayennense*; *Spreng.* 2. *A.* lanceolatum; *Kaulf.*

** ECOSTATA.

3. A. coriaceum; *Spreng.* 4. A. Boryana; *Spreng.* 5. A.

plantagineum; *Kaulf.* 6. A. reticulatum; *Kaulf.—Illust. Hook. et Grev. Ic. Fil. t.* 46, 74. *Schk. crypt. t.* 6.

Obs. Although I have characterized the former genus *Polytænium*, as being distinct from *Antrophyum*, yet it must be admitted that its technical character of having three transverse parallel sori, depends in a great measure on the narrow linear character of the frond, a nearly similar character being observed in *A. coriaceum*, which has irregular, interrupted, transverse sori, and which evidently forms a transition between *Polytænium* and the wide-fronded species of *Antrophyum*. In some of the species, the sori are formed only on the oblique sides of the areoles, thus presenting sori nearly similar to *Loxogramma*, but that genus differs from the present one by the sori being formed on the crossings or confluence of the venules.

36. Hemionitis. *Linn.*

Venation uniform, reticulated, sides of the areoles sporangiferous. *Sporangia* superficial, forming complete reticulated linear *sori.*—Fronds *simple, cordate, palmate or pinnate, smooth or villose, areoles nearly equal-sided.* Sori *becoming confluent.*

Examp. 1. H. cordata; *Roxb.* 2. H. palmata; *Linn.* 3. H. pinnata; *J. Sm.—Illust. Hook. et Grev. Ic. Fil. t.* 64. *Schott. gen. fil. t.* 13.

Obs. The habit of this genus is very different from the former, yet I must confess that the character of superficial sori is but slight grounds for separating them upon, especially as in *A. lanceolatum*, the sori are not, or scarcely, immersed, but however slight their technical distinctions are, yet I cannot allow myself to think that they should be retained in the same genus.

37. Ceratopteris. *Brong.*

Fertile fronds contracted; margin (of segments) reflexed, membraneous, conniving, indusiiform. *Veins* transversely elongated, distantly anastomosing. *Sporangia* occupying the lengthened, transverse venules, superficial, forming two linear-continuous, parallel sori.—Fronds *fragile, of two forms, the sterile sinuate-pinnatifid or bipinnatifid, fertile decompound, multifid, laciniæ linear, revolute, forked, viviparous.* Sporangia *large, sessile, furnished either with a broad nearly complete or very short nearly obsolete ring.*

Species. 1. C. thalictroides; *Brong.* 2. C. Parkeria; (Parkeria pteridioides; *Hook.*)—*Illust. Bauer's gen. fil. t.* 12. *Hook. et Grev. Ic. Fil. t.* 97.

Obs. The very distinct and peculiar habit of this genus renders it difficult to determine its real affinity; for, besides the very distinct character of the fronds, the sporangia exhibit a peculiar structure, being large, globose, and either furnished with a broad nearly complete vertical ring, or with a very short or nearly obsolete one, and which according to the views of some authors is said to be transverse, and the genus has therefore been hitherto associated with *Gleichenia;* but observations have shown that the ring rises from the axis of attachment, as in *Polypodiaceæ.* The supposition of its being transverse may have arisen by observing the direction of the sporangia in connexion with its attachment, it being generally loose and decumbent. And on reviewing the whole of the structure of this singular genus, I am disposed to consider it to have more affinity with genera belonging to *Polypodieæ,* than with any genus of the succeeding tribes.

(*To be continued.*)

III.—BOTANICAL INFORMATION.

UNIO ITINERARIA.

Mr Pamplin has recently received the second portion of Schimper's Abyssinian plants for distribution; that is, Sectio prima, Pars 2da., consisting of two hundred species. The Report which accompanied these plants is highly satisfactory; no doubt being now expressed as to the ability fully to cover the claims of the original subscribers, at the very low rate first proposed, of fifteen florins per century. The same announcement confirms the original determination of the Directors, namely, that no new subscriptions shall be received at that low price. New subscribers, whose aid is most respectfully and urgently requested, will be now required to pay at the rate of not less than twenty florins per hundred.

The first distribution of Kotschy's Cordofan (south Nubian) Plants will be ready in the month of June. Each set will consist of four hundred species. For these plants the subscription price is still open, at fifteen florins per hundred.

New Zealand Botany.

We have very great pleasure in announcing that Mr M'Calla of Dublin, who has been long engaged in collecting and preserving objects of Natural History for Professor Scouler, and for the Royal Dublin Society, is about to embark for New Zealand, for the sole purpose of making *Botanical* collections and chiefly in the southern and less frequented districts of the group. We believe him to be entirely competent to engage in so important an object. We have offered him every facility in our power towards furthering so laudable an object, and especially in naming his plants; and have suggested that he dispose of his well-dried specimens to the public, at the price of £2 the hundred species, for phænogamous plants and Ferns; and £1 the hundred species for the other Cryptogamiæ, a family of plants which has already occupied much of Mr M'Calla's attention.

The ardour with which Mr M'Calla enters upon this undertaking, warrants us in believing that he will not disappoint the hopes of those Naturalists who are disposed to encourage him.

We are informed of the following Hortus Siccus being now on sale in Paris:—

Herbier de M. Thiébaut de Berneaud, bibliothécaire de la bibliothèque Mazarine, auteur de plusieurs ouvrages sur l'histoire naturelle, l' agriculture et d' un voyage à l' ile d'Elbe, traduit en Anglais en 1814, par W. Jerden.

Cet herbier est composé de plus de quatre milles plantes provenant de ses herborisations en France, en Suisse, en Italie, et une partie de la Grèce.—2. d' échanges ou d' énvois à lui faits par les botanistes les plus célèbres, tels que Broussonnêt, Blume, Cavanilles, Desfontaines, Gouan, Hornemann, Martius, Nees d' Esenbeck, Persoon, Pursh, Schwægrichen, Smith, Stackhouse, Tenore, Wallich, etc., etc.

Cet herbier, rangé en partie alphabétiquement, partie par pays ou par familles, renferme toutes les plantes des Alpes, des Pyrénées, de la Corse, et un bon nombre des Canaries, de l' Amerique, de l' Inde, de la Polynésie et de la Suède. Ces dernieres lui ont été données par Thunberg.

Phanerogammes et Cryptogrammes tout est bien etiqueté.

Drummond's Mosses of the Southern United States.

Almost before we have had time to announce that some copies of the late Mr Thomas Drummond's specimens of Mosses, of the Southern United States, had been beautifully prepared by Mr Wilson, nearly the whole of them have been disposed of. The very few that remain are in the hands of Mr Pamplin.

A new station for the rare BUXBAUMIA APHYLLA.

The most abundant British station for this truly singular and rare Moss has lately been detected in Scotland upon the Campsie hills, Stirlingshire, above the Craw-road. Its fortunate discoverer, G. J. Lyon, Esq., of Glasgow, was enabled to collect forty-three specimens, in the highest state of perfection. Our very zealous botanical friend, Wm. Gourlie, Jun. Esq., on visiting the same spot a few days after, gathered four more specimens.

Botanical information communicated by Dr FALCONER, *Director of the Botanic Garden, Saharunpoor, to* Dr LINDLEY.

I have just received your volume of *Arethuseæ.* My *Gamoplexis,* which you notice, is very different from *Gastrodia:* the perianth is tubular, with a 6-lobed limb; the labellum composing a portion of the tube and not free; and the labellar lobe of the limb differs only by being a little larger than the other lobes, besides other distinctive marks. I purpose sending Royle a drawing and description with specimens, by next mail. Should you have any supplementary number, I could furnish several new genera and species. One of the genera is a magnificent plant allied to Blume's *Cyrtosia,* which I have named *Pogochilus,* with pulpy pollen-masses which are doubled together, "terete-conduplicate," in horseshoe fashion, with an articulated deciduous perianth, and aphyllous; with subterraneous squamate stems, and a leathery strictly 3-valved capsule, without costæ or any interruption of tissue. I cannot bring my mind yet to rank it in any way under the *Arethuseæ.* You will, I presume, soon be through the *Neottiæ,* among which I see you range *Zeuxine.* Should you have good specimens I recommend this plant to your particular notice. I have examined it minutely, and find the pollen anything but powdery; it is waxy, exactly as in the *Ophrydeæ,* "composed of flat pyriform angular massules attached to a central elastic thread, and imbricated over each other as in the *Ophrydeæ;* when the elastic axis is extended, the massules (organs) can be seen adhering separately, as in Bauer's drawing, (*Lindl. Illust. Orchis Mars,* iii. *fig.* 7.)" Such are my notes. The position of the stigmatic surfaces is also peculiar. Perhaps you may not have fresh specimens to examine, and my description may not be unacceptable. Here it is;

"ZEUXINE. *Lindl.* Pterogodii spec. *Roxb.*"

Perianthium ovario incumbens fornicato-connivens. *Sepala* lateralia libera, supremo basi saccato grandiore. *Petala* subæqualia cum sepalo supremo in galeam adglutinata.

Labellum anticum porrectum, basi membranaceum saccatum minute bicallosum columnæ faciei accretum, medio constrictum apice carnosum dilatatum. *Columna* brevissima; clinandrio (magno) membranaceo antheram involvente. *Anthera* terminalis opercularis persistens, prona membranacea bilocularis; loculis approximatis incomplete bilocellatis. *Pollinia* 2 bipartibilia (vel si mavis 4 per paria connexa) e massulis angulatis cereaceis (nec pulvereis) innumeris, elastice cohærentibus conflata, caudiculæ spathulatæ infra apicem affixa. *Glandula* ovata incurvata. *Rostellum* elongatum bifidum, supra labelli saccum horizontaliter extensum cornubus acuminatis. *Capsula* ovato-globosa, costis angustatis. *Semina* exilissima.—Herba *pusilla terrestris* 3—4 *pollicaris.* Radix *succulento-fibrosa.* Caulis *erectus, basi foliorum delapsorum vestigiis annulatus.* Folia *lineari-lanceolata acuminata coriacea adpressa margine reflexa, subtus carinata, colore fusco-cinereo.* Flores *dense spicati; (spica triseriatim spirali) albidi vix roseo tincti, labellum luteum carnosum.* (*Bracteæ ovato-acuminatæ flores superantes*). In regard to the female apparatus, the gynizus appears to be made up of two stigmata, the confluence of their tissue being in the axis of the fork of the rostellum, indicated by a white line running through the middle of the floor of the clinandrium to the base of the fork along the axis of the caudicula. The stigmatic patches to which the pollen-grains get somehow applied, are placed at the sides of the column near the apex.—Your *Apaturia* has the roots, " tubera irregulariter nodoso-incrassata repentia."

I may add the characters of a new neottieous genus which I have named *Cordylestilis.* (Fal.).—*Perianthium* globoso-connivens (clausum). *Sepala* libera æqualia, supremo cum petalis subæqualibus in galeam adglutinato. *Labellum* sessile erectum concavo-ventricosum cum columnæ basi connatum indivisum, apice incrassato-bituberculatum revolutum, sacco intus fimbrilligerum. *Columna* brevis incrassata basi constricta. *Anthera* dorsalis, mobilis clinandrio cavo marginato semi-immersa, rostello erecto bifido incumbens, bilocularis loculis longitudinaliter bilocellatis. *Pollinia* 4 (pulverea) cavata per paria glandulæ minusculæ ovatæ communi affixa. *Stigma* clinandrio parallelum, totam columnæ faciem occupans. (*Capsula* cylindraceo-oblonga).—Herba *terrestris glabra* 1½—*2-pedalis, radicibus oso-fasciculatis caule erecto stricto basi lioso supra vaginato, foliis ovali-lanceolatis coriaceis glabris; spica cylindracea confertim multiflora, bracteis membranaceis acuminatis, floribus albidis parvulis, labello torsione pedicello antico.*

Cordylestylis *foliosa;* (Fal.)

Hab. in umbrosis acclivibus montium Himal prope Rajpoor, circiter 3500 pedes supra mare, et in Hort. Botan. Saharunp. introduct. Flor. Aprile.

Should *Cordylestylis* (from the clubbed shape of the column) be a preoccupied name, it might be called *Oncidiochilus* (from the tuberculated apex of the lip.) Possibly the plant may be among Wallich's Nepal *Orchideæ.*

I have just sent home through Royle, to R. Brown, an account of a new genus of a peculiar type which I have called *Enantia,* which appears to me to constitute a new group. The flowers are 5-merous and hermaphrodite; the petals, sepals, and stamens, in the same line of radius from the axis (opposite); two ovaries cohering slightly at the base, each containing two ovules; the fruit two drupes, which are reniform and oblique, with the style carried down by the mode of growth to the base, exactly as in the *Menispermaceæ;* the seeds solitary; embryo curved, with the radicle bent towards the hilum; no albumen but a thickened endopleura; and dotted testa. A twiner with alternate simple leaves; no stipule; the wood with thick medullary rays, but no distinct concentric zones; the calyx open in æstivation, the petals naked and convolutely imbricated. The fruit in appearance is exactly that of a *Cocculus.* I am utterly at a loss about its affinities. You can see the plant likely in Royle's collection as *Rhamnus purpureus.* I have at present another puzzle in hand from Cashmeer, which I can refer to no known natural order; the characters are four unequal deciduous inferior sepals; valvate in æstivation, petals 1—4 or none, hypogynous; stamens hypogynous, inserted on a slightly thickened torus, varying in number, from 8—14; deciduous. Anthers caducous. Ovary 1, composed of two or more carpels supported on a short gynophore; the carpels *parallelly* united, with a central column intervening, which is continuous with the style above, and the gynophore below. Ovules solitary, attached transversely to placentæ at the middle of the axis. Style very short and thick. Stigma undivided, globose, depressed and papillose. Samara didymous, or by abortion unilocular with a broad wing. Seed reniform, no albumen. Embryo curved; radicle bent into proximity with the hilum. Plumule inconspicuous.—A succulent herbaceous plant, with simple thick stems, alternate exstipulate divided leaves, terminal, aggregated cymes, and small white flowers. I have not quite made up my mind about its nearest affinities; but it appears to form the type of a distinct group perhaps representing in the Himalayas what *Limnanthes* is in North America. There is no obliquity in the position of the carpels, and the stalk of the ovary is more a gynophore than a gynobase in the restricted sense. I send home an account of it next month.

P.S. I shall in the spring have prepared a good account of *Trewia*, which I have lately found growing in this part of India. It is one of those fine anomalies which the Flora of India is so rich in. Roxburgh is right about the character of the embryo and albumen; but I don't think you have hit upon its affinities. I have found specimens with the carpels disunited, in combination with other irregularities, which have surprised me not a little; but I have only seen specimens out of flower in the dried state, and am not quite sure about my ground yet, and postpone saying more about it at present.

Notes on Algerine Botany, by M. Bory de St Vincent.

"It is my intention to start, the first fortnight in January, on my return to the East, and to spend the entire winter in that country, as well as in the neighbourhood of Constantine. My desire is to take advantage of that time in order to penetrate into the interior, where the hot season commences early. With the exception of some days of rain, and of a severe tempest which we encountered at sea, on our return from Bougie, October, November, and the past month, have been extremely fine. Assuredly the proper time for a lover of Natural History in Africa, is from October to mid-June; as the four intervening months are, with few exceptions, times of deplorable drought and desolation. The heavy rains, of which we hear so much, certainly sometimes come down with great fury, but they seldom last long, hardly ever for eight days together; and, since I have been here, there has not been one week in which we have not had at least some half-days of fine weather. As soon as the summer closes, and rain begins to fall, the country is clothed with fresh verdure, and autumn produces not only its own stock of plants and animals, but an entirely fresh animation and vegetation. The only difference between this second crop and the first, is, that the specimens are not quite so fine. There are more than a hundred species that may be regarded as purely belonging to winter, which begin to expand in their greatest beauty in the middle of November, and go off by the end of February, or earlier. In the province of La Calle, where we resided from November to December, the whole face of the country was glittering with most brilliant varieties; and Durieu, whom I left there to botanize, finds his time more than employed in examining the different species of Fungi, as abundant there as in the forest of St Germain. Hitherto I believe that it has hardly been suspected that Africa was so rich in this description of plants. How cursorily the country has been investigated, and how carelessly and absurdly our good predecessors have botanized, it would be difficult to describe. Would you have believed that the yellow and white *Nymphæas,* in spite of their great size of flowers and foliage, have entirely escaped their notice, together with seven species of *Polygonum;* and more than a hundred and fifty different European plants, and these in the district of La Calle alone. One would think that they had not even given themselves the trouble to observe these facts, essential as they are to geographical knowledge. As if to make up for their remissness, they certainly have, Desfontaines in particular, discovered things that never existed there: for instance, the *Aspidium filix mas*, and *Quercus Robur*, neither of them natives of Africa, although the forests of La Calle abound in *Aspidium filix fæmina*, and possess an entirely unknown variety of oak. This is one of the finest and grandest trees imaginable—measuring from two to three metres in circumference, and sixty feet in height, pyramidal, and with leaves shaped like those of the Chestnut, but larger, dark green at top, and white and downy beneath. The acorns are very small, and have a bitter taste. It is not uncommon to find the *Osmunda regalis* six feet high, and the common Ivy leaves five inches across.

"The temperature of the climate here is far more even than in the rest of Africa; for the centigrade thermometer has never stood below 11°, nor risen above 30°, in the shade: so that the inhabitants enjoy a perpetual spring.

"There are as many as six distinct species of the Feline tribe: the Wild Cat, Lynx, Caracal, Serval, Panther, and Lion. The last two, which issue from the recesses of the forests towards evening, are as common here, particularly at the passage of La Matrie, as the domestic cats upon the pantiles in your part of Paris.

"Before going to La Calle, I made a week's voyage to the deserted isle of Golite, about twenty leagues from the coast of Africa, which had never hitherto been visited by any naturalist. We found it of volcanic construction. It has apparently but lately emerged, and is allied to the division *Pantellaria* and *Sicilia*. The vegetation is most scanty—since the wild-goats and rabbits, which inhabit it in great flocks, devour every leaf of every plant, as well as every vegetable upon the island. Upon the highest peak, where the clouds rest, and keep up a constant degree of humidity, some lichens are to be found. Year by year the natives of Tuscany come here to collect Archil.

"There is a charming spring of sweet water in a grotto lined with *Adiantum*, which grows in the moisture at bottom. I am surprised that some philosopher, disgusted with the world, does not come and act Robinson Crusoe in this delightful spot, where he would find abundance of crabs and lobsters to eat.

"I must now conclude this account of my researches last autumn. I write from Algiers, whither I was recalled by matters of business; and I shall resume my excursions as soon as I have completed a little tour that I hope to make to Bleda next week."

Harvey's Manual of BRITISH ALGÆ.

THE Honourable W. H. Harvey,* who has so long and so successfully directed his attention to the *Algæ*, both of the sea and of fresh water, has left in our hands an admirable *Manual* of all the British species which Mr Van Voorst has undertaken to publish. The printing of the volume is rapidly advancing, and Mr Newman directs the typography, and sees to the careful correction of the press. Such a work cannot fail to be acceptable to every British Botanist, and to do great credit to the well-known talents of the author.

Extracts from the recent letters of MR JAS. DRUMMOND, *chiefly relating to Swan River Botany.*

THE first of the letters to which we allude is dated Swan River, September 3d, 1840. "I sent you," he says, "about Christmas last, by the 'Shepherd,' a box containing nearly 1300 Swan River plants, together with a long letter on the botany of the colony. (This letter appeared in our Journal, vol. iii.) No opportunity has since offered of sending you additional species. There is indeed seldom an occasion of doing so direct from Swan River to London, except by the vessels which take home the wool and oil, which are our principal exports. In the collection I sent you there were about 130 *Proteaceæ*, and I have since met with a few additional species. Among them are two *Hakceas* with round leaves belonging to Mr Brown's first section, and one with sulcate leaves of nine or ten inches in length; two *Grevilleas*, one a various-leaved species: those on the barren branches below ovate, acuminate, silvery above, 3-nerved and silvery below; while those on the flowering branches are filiform, and regularly sulcate: the flowers are produced on long branching racemes, and the old and empty seed-vessels, which remained on the plant when I discovered it, were remarkable for their small size and great length. I have found a *Xylomelon* on Gangan with long narrow willow-like leaves, which must be distinct from Cunningham's *X. salicifolia*. The seed-vessels are about an inch and a half long, and an inch broad; and the entire plants were about ten or twelve feet high; the full grown stems about two inches in diameter. I possess a *Dryandra* with leaves about an inch broad, and three or four inches long, with long serratures at the edge alternately turned up and down like the teeth of a wide set saw. Most of the large genera of *Proteaceæ* appear to me to contain plants that have little relationship to each other. In *Dryandra*, for instance, the cuneate-leaved species, which grow to the size of small trees, with naked receptacles, even the scales outside of the collection of flowers, are deciduous before the seeds are ripe; these seem to me to form a natural group. I am aware that some botanists have made genera of the aphragmous and diplophragmous species; but the form of the seed alone will not divide these plants into natural genera. I have met with seven aphragmous kinds, either species or varieties; six of them may constitute a natural genus, but the seventh (that which I described as having flowers like the Cape Honey-bush,) has little relationship to the other aphragmous species, or indeed to any other *Dryandra* I am acquainted with. Of the *Diplophragmas* I have detected three species: *D. bipin-*

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* Now resident at the Cape of Good Hope.

nata of Fraser; a lesser bipinnated one, which you perhaps consider only a variety; and the curious spiral-leaved one which agrees with *Diplophragma* in the form of the seed-vessel and habit of the plant, but has little resemblance in the flowers. Mr Brown describes the *D. bipinnata* of Fraser as having wings at the end of the seed, and that is the case with my *D. spiralis;* but the lesser bipinnated one has the wings of equal breadth all round the seed. The flowers of Fraser's plant are very rarely produced, and the seeds extremely so. I have none by me at present.

" I have here met with a curious plant which I think must form a new Genus nearly allied to *Mesembryanthemum.* The seed-vessels are peculiar and beautiful; and, contrary to the nature of most plants, they open when in a moist state, and shut when dry. When the valves are expanded, they bear some resemblance to the flowers of *Hoya carnosa.* It is my intention to send you some of these seed-vessels by the first opportunity, and you have only to put them into water, when they will expand and show their curious structure. I observe that they remain on the plants for years after the seeds are ripe, opening with every shower of rain, and even with the moist atmosphere of the night, closing in dry weather and during the day. The plant grows in large patches, many yards in extent, resembling the Hottentot-fig in its leaves. Its place of growth is on sandy ground near a spring, called *Ribachgoin,* in the desert country which I have described in my letter sent home by the Shepherd.

" I intend starting in a few days on a botanical excursion overland in the direction of King George's Sound, and purpose being absent about two months. When I return, you shall hear from me, or I may, if I can find an opportunity, write you from the Sound. Mr Preiss has left this for King George's Sound. He intends visiting South Australia. I, for my part, shall keep a Journal of any thing I may observe in Natural History, and send it to you on my return."

P.S. " We have at length discovered the plant which has destroyed so many of our sheep, goats, and cattle, in the manner I sent you some account of by the Shepherd last year. It is not the *Lobelia*, (as I had surmised) but a leguminous plant growing about two and a half or three feet high, with glaucous lanceolate leaves, about two inches long, ending in a sharp point, and each furnished with two minute, prickle-like stipules; the flowers are orange-colour, and produced, several together, on a sort of raceme which grows from the axils of the upper leaves. The leaves are frequently three in a whorl; the flowers, when expanded, are about half an inch in diameter; they are succeeded by hairy seed-vessels, about the size of a large pea, which are spotted with brown, and permanently crowned by the style.

"There has been much difference of opinion among the settlers, as to the cause of the death of so many of our flocks and herds. Dr Harris, who has had much experience in sheep and cattle, was of opinion that the animals died of a dangerous inflammatory disease. He had published a letter to that effect, which brought over most of the members of our Agricultural Society to his opinion; but his son, Mr Joseph Harris, thought with me that the animals died of poison. He had lost about fifty sheep on his farm, on the William river, a few days before I visited him, and the exact spot where the sheep had been feeding, when they were thus affected, was known. I found that there were but a few plants of which the sheep ate on these occasions, which could possibly cause their death, and these I determined to put to the test of experiment. The *Lobelia* I had tried a few days before, yet although the juice is extremely acrid, it appeared to have no bad effects on a sheep to which it was given. Several circumstances had caused this plant (the Leguminous one) to be suspected. Mr Harris called it the Sage plant, from its having in its leaves some resemblance to the common garden Sage. He had observed that a flock of sheep which his father and himself brought from the Sound to the William, without loss, did not feed on this plant; whereas another flock which were brought by the same parties and by the same road, ate of it, and many of them died immediately after. Mr Tapson had recently lost 304 sheep, in bringing a flock of 400 from the Gordon River to Egenup, a distance of about thirty miles. He left with us a specimen of this Leguminous plant which he had observed his sheep eating, and as we found it growing where Mr Harris's sheep had been feeding, we determined to put it to the test of experiment, (for there is nothing either in the taste or smell of the plant that in the least indicates its poisonous properties.) A few handfuls of the young tender shoots were pounded in a mortar, and water added, and the juice squeezed out. We had about a middle-sized tea-cupful of the mixture, of which about three parts out of four were water. It was put into a bottle, and given to a he-goat, a fine healthy animal. About eight o'clock at night the animal ate about an ounce of the plant of his own accord, after he swallowed the juice. At five o'clock in the following morning, he continued to chew his cud, but appeared languid, when we gave him about half as much more of the same mixture. Soon after he got the second dose, he began to call out, as goats always do when suffering from this poison: at ten o'clock he died. We opened him an hour after death, and found the heart and lungs gorged with dark-coloured blood. I have no doubt but the poison operates on the nerves, and in that way altogether stops the action of the lungs and heart. I had observed this plant at Black-Adder creek where accidents have happened, and on the Toodjay road; and I have, since we discovered its dangerous properties, found it on the York road, where so many of our animals have been lost. It is a plant that may be easily destroyed near the settlements, and avoided or destroyed on the public roads. There appears to be some reason to hope that flocks of sheep which have been long in, or reared in the colony, learn (for they do not all die that are ill from its effects) in some measure to avoid the plant which destroys so many of them. The first flock of 200 which were brought to the William by Dr Harris without any loss, were part of the late Sir Richard Spencer's, and about 200 more from the same flock were brought over with a loss of only five or six. Mr M'Donnel's loss was mostly last year's lambs; and myself and sons, when taking our cattle over the Toodjay district, lost all the young cattle that were sucking, about six months old at the time."

The second letter was dated "Guildford, December 6, 1840."

"I wrote you lately from King George's Sound, by Mr Taylor,* with some few remarks on the botany between this place and the Sound, a distance of about three hundred miles, during which I crossed six considerable rivers; 1st, the Dale, distant about eighty miles south by east from Freemantle; 2d, the Hotham, about forty miles further; 3d, the William, about twenty-six miles; 4th, the Arthur, (Calgil of the natives), about twenty miles; 5th, the Beaufort, (Guanerup of the natives), about twenty miles; 6th, the Gordon (Packilgenup of the natives), about fifty miles. The Dale runs from west to east, and falls into the Avon; the others run from east to west, and fall into the sea or other rivers; little however is known of their courses. Several no doubt are the same rivers that are known by different names at the coast. I was unable to visit Mount William or Saddleback on my return, for want of provisions, as they happened to be without a supply at the military stations which were near them. The highest hills which I did examine, were about twelve to fifteen hundred feet high, and of the same description as those I sent you an account of by the Shepherd. The *Xanthorrhœas*, so abundant in the Swan and York districts, with the exception of a dwarf species, (either the common underground kind, or nearly allied to it,) disappear on the Dale, and do not occur all the way to the north of Mount Bachu, nor to within thirty miles of King George's Sound. To the south of Mount Bachu, a broad-leaved arboreous species, different from our Swan River kinds, is common. Between Mount Bachu and the Sound is a sort of moorish land, with streams of water that run most of the summer, and this is extremely rich in plants; so much so that I think one thousand species may be found here which do not grow at the Swan. In the Genus *Banksia*, for example, five or six of our Swan River species are found here, but there are ten growing here which are unknown at the Swan; and there are several of Mr Baxter's that I have not yet met with. I sent you, by Mr Taylor, some seed-vessels and an account of three new *Banksias*, which I discovered between Mount Bachu and the Beaufort; and I have now to add another, one of the finest of the whole genus, a scarlet-flowering species, which is common on the banks of swampy brooks, first appearing about five miles to the north of the Sound, and continuing in all the similar valleys for twelve or fourteen miles. It grows eight or ten feet high. The leaves are exactly like those of *Dryandra senecifolia* of Baxter. Of *Dryandra* I have met with eight species which I do not recollect to have seen at the Swan. I formerly sent you some account of a stemless species with very large leaves, which grows to the north of the William on the top of some iron-stone hills to the south of the Beaufort; and now again I have discovered another fine *Dryandra*, nearly allied to *D. bipinnata* of Fraser; but the leaves are smoother, and only a few of the largest divisions are again divided. But the flowers are very different; the scales which are broad and long in *D. bipinnata*, are in this very narrow and recurved; the seeds I have not seen. There is likewise a small species near to the *D. squarrosa* of Baxter, which I think is new, and I am in doubt about some of the other species. Most of the specimens I collected were left at the Sound, and I do not expect them to arrive here till the end of January. I have been very unfortunate since my return here; for on going into the river to bathe, I got entangled among mud and weeds, and while endeavouring to extricate myself, I got one of my feet so much cut with a broken bottle, that I do not know when I shall be able to walk again. I have received orders for about £100 worth of native seeds, but by this accident I shall not be able to supply them. As soon as I am able to walk and can find an opportunity, I will send you specimens of some of the plants I have met with since I sent you the things by the Shepherd. Of the Natural Order *Proteaceæ*, I have now collected about two hundred and forty species."

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* This letter has not yet come to hand.

J. D.

IV.—*On the Structure and Functions of the* POLLEN. By JOHN ALDRIDGE, M.D., Lecturer on Natural History to the School of Surgery and Medicine, Digges Street, Dublin; Member of the Dublin Natural History Society, &c.

IN the September Number of the *Journal of Botany*, I described some observations which I had made on the process of impregnation in plants. A more complete account of these observations was made to the British Association at its subsequent meeting; and on the same occasion an Atlas was exhibited, which presented drawings of the appearances exhibited by the Pollen of the greater number of Natural Families, in the dry state, when moistened with water, and when burst through the contact of acids. I stated, on both these occasions, the results of my investigations to be,—first, that the stigma is invariably acid at some period of its growth; secondly, that it is in consequence of this acidity, that the pollen bursts; thirdly, that by the same means, the fluid contents of the pollen become coagulated, enveloping the fovilla, and assuming, according to the method of dehiscence, different, and very remarkable forms.

Unable to attend personally the meeting of the British Association, I felt happy in the assurances of my friends, that the many eminent men present, appeared prepared to admit the results to which I had been conducted. It was asserted, however, that my views were not original, but were already contained in the works of Mohl and Fritzche.

As the determination of the truth is of much greater importance than any thing connected with individual reputation, I ought, perhaps, to have been pleased with this confirmation of my researches; but, I must confess, I felt my mortality on this occasion; it was too bad to lose the labour of years in this manner; and I hastened to examine the writings of my German contemporaries, to ascertain whether they really had anticipated me.

This introduced me to a memoir by Fritzche, contained in the Transactions of learned Foreigners, published by the Royal Academy of St Petersburg, and as this is the latest work on the subject containing his own observations, together with an examination of the labours of others, and as the Memoir is likewise replete with new and most interesting matter, I shall present a digest of its contents to the readers of this Journal.

I shall first quote a passage, which will sufficiently demonstrate, that my views with respect to the process of impregnation, are not identical with his.

"To perceive and rightly understand in difficult cases, the details of external forms, I was obliged to make use of certain reagents and means, by whose assistance I was enabled in a former treatise to insert a description of forms. The objects of my inquiry in the employment of acids, has to a certain extent failed: I fully described in my treatise the effects of these on the Pollen; but their office has since been misunderstood by many persons. It has been supposed, for example, to be my opinion, that the protrusion of the inner mass, under the influence of acids, upon the apertures of the Pollen, and which in many cases, has the appearance of a little tube, is the actual tube, which through the stigmatic tissue, produces fertilization. To justify myself against this supposition, which I am fully prepared to disprove, I need merely quote a passage from page 35 of my treatise:—'*The expression, tube* (schlaüche), *which I have frequently employed as the name of the gutlike protrusion, which constitutes the prolongation expelled by acids, is certainly misapplied, since it is not surrounded by any membrane; but as this mass proceeds from the same part as the real tube, that by its action produces* *fertilization, it seems to me better to call this by the same name than to invent for it another appellation, inasmuch as I can distinguish the one as an artificial, the other as a natural tube.'* I have in this quotation compared the operation of an acid and the stigma, for the purpose of clearly explaining the supposition therein expressed—namely, that the natural tube is, as I have always considered it, a continuation of the inner membrane, produced by the prolonged growth of the inner mass of the pollen, according as nourishment was supplied, an hypothesis in which I already participated, and I therefore took care to employ expressions, which might convey the idea that this tube lengthened itself at the expense of the fluidity of the stigma."

The above quotation renders it evident, that Fritzche was not aware of the constant acidity of the stigma, nor of the power which its acid secretion possesses, of causing the dehiscence of the pollen grains. I might here recapitulate the arguments which I have used elsewhere, in advocacy of the opinion that the *boyau* is not a tube, but a coagulated heterogeneous thread. Fritzche, it appears, maintains a contrary opinion, and it is my present object, not to prove the correctness of my own views, but to show that they differ from his. This observer first published the fact, which I had independently discovered in 1832, that acids are capable of producing the dehiscence of the pollen; but in the passage before us, he compares the action of an acid, and of the stigma, for the purpose of showing their difference, and tells us that the natural tube grows at the expense of the fluidity of the stigma, being obviously ignorant that this fluidity is acid, and capable of acting as an acid on the pollen grains. If he was aware of this, the *onus* lay on him to show, why the acid liquor on the stigma should not act like acids elsewhere, but produce a natural tube, instead of what he calls an artificial tube. It may appear strange that he should be aware of the influence of acids, and yet not examine the chemical reaction of the stigma; but with this I have nothing to do; I knew the same thing for six years, before the idea occurred to me, that it was the probable (and experience has since shown it to be the actual) means used by nature in the process of impregnation.

Before I conclude this part of the subject, I feel it necessary to acknowledge that I have expressed Fritzche's views erroneously in the paper read before the British Association, as relates to the influence of acids in coagulating the fluid contents of the pollen. I mentioned in that essay the grounds upon which I conceived him to have overlooked this reaction ; being at that time only acquainted with Fritzche's observations, from the notice of them contained in Lindley's introduction. In this work, it is stated, that "in particular, he (Fritzche) recommends the employment of sulphuric acid in the proportion of two parts of concentrated acid to three parts of water, for the purpose of viewing the pollen by transmitted light; by this means it is rendered *transparent*, and the spontaneous emission of pollen-tubes is effected." (Vide Op. cit. *p.* 159.) Now, instead of acids rendering the pollen grains *transparent*, I was led to the observation of the coagulation of the fluid contents, by perceiving them to become *opaque* under the influence of these agents. But the observations of Fritzche must have been misquoted by Lindley, for in page 668, of the work before me, he distinctly states that the mucus of the pollen-contents is coagulable by acids.

It appears then that as far as Fritzche is concerned, the originality of the propositions, viz., "that the stigma is invariably acid at some period of its growth, and that it is in consequence of this acidity that the pollen bursts," rests entirely with me; and that my third proposition is confirmed by the observation which deprives me of the merit of first detecting it. I have been unable to obtain Möhl's work, but I infer that if he had been aware of the acidity of the stigma, Fritzche who wrote subsequently, could not have been ignorant of it.

I now leave the subject of priority, which I hope to be excused for having brought forward at all. Indeed, I feel convinced, that the gentlemen whose names I have ventured to introduce, would be the last to appropriate the discoveries that have been ascribed to them; and, on the other hand, it is easy to comprehend how a vague recollection of the influence of acids upon the pollen, may have led some gentlemen, present at the meeting of the Association, to have confounded my discoveries with theirs.

To proceed to the analysis of Fritzche's valuable memoir, a chapter, purporting to treat of the structure of the pollen in general, is principally devoted to an examination of the organ called *globule* in *Chara*. He considers this to be identical with the anther of higher plants: his description of the different portions of this organ are exceedingly minute, but, without the accompanying plates, it would be useless to repeat them here.

The next chapter treats of the contents of the pollen. This, which has received the name of *fovilla*, is a mixture of different chemical substances, which can be severally recognised by reagents. We are easily capable of perceiving three classes of substances—namely, mucus, oil, and starch; the last we can alone ascertain with sufficient exactness; the first being a mixture of different substances, whose chemical union we cannot distinguish with our present instruments; and the second most probably exists as a mixture of different oily bodies.

The *mucus* of the fovilla, is a colourless substance, which in water swells very much, without, as it would appear, being permitted to dissolve itself therein; it acquires, through solution of iodine, an intense yellow-brown colour; it becomes coagulated by acids, and either dissolves in concentrated sulphuric acid, or being soaked in it, becomes transformed into a very transparent gelatinous mass. The property of swelling in water, which it participates with Bassarine, is the cause of the bursting of the pollen-grains, when they come into contact with water; the membranous integument becomes at first distended, but when the maximum of its elasticity is attained, it very often cannot resist the force with which the mucus still sucks in more water, and then it bursts, either at the most convenient, or not unfrequently, at an appointed spot. It now happens that a portion of the swollen fovilla is squirted out with a little explosion; this is produced by a double cause: on the one part the fovilla is already swelled by the water, and, on the other, the distended membrane is brought together again by virtue of its own elasticity: under these circumstances, the expelled fovilla presents itself under the appearance of a long-drawn tubular (schlauch förmige) mass, and permits, in this particular situation, the nature of its mucus to be sufficiently examined. [There appears, in this instance, a discrepancy with the author's former statement, as there is an inconsistency with fact. If the mucus swells like Bassarine in water, why should it retain a cylindrical form in this liquid? and I have always found that, except when the fovilla was already coagulated by an acid, the mucus rapidly diffused itself through water, and permitted the opaque particles to scatter themselves irregularly.] By the action of acids the mucus is converted into a grayish tenacious mass, which no longer scatters itself into flocks, but according to its kind, appears, between two glass plates, in a long-drawn, cylindrical, continuous mass, from which the membrane either doubles together, or along with which it becomes so obscure, that treated in this way, its appearance may be regarded only as an exception. [This description only applies to pollen that dehisces by pores; when the rupture takes place by a slit, the form of the fovilla often remains unchanged.]

In a dry situation, as when placed in free air, the pollen becomes characterized by its mucus being tolerably transparent; but this transparency disappears when it is moistened with water. This circumstance, the author explains, with Möhl, by supposing, that the dry mucus, and the little oil-drops, possess by chance an uniform light-refracting power; and from thence it naturally results, that the fovilla, by sucking up water, loses its transparency; this former uniformity becoming destroyed.

Besides the mucus, capable of being coloured yellow-brown by iodine, the author has found, in some plants flowering in water, a coloured gelatinous slime, which suffered no alteration by iodine: this is only to be accurately distinguished from the other constituents of the fovilla, in the *Najas major*. Yet he thinks its occurrence is universal, and that it agrees in its characters with the inner membrane of the pollen, so that it is not improbable, that it furnishes the material for the *boyau;* [*i. e.* the imaginary membranous tube, continuous with the inner membrane, and growing at the expense of the stigmatic fluid.]

The second, and never absent constituent of the fovilla, is the oil, which lies distributed in very small drops, through the whole mass of the mucus. We recognise it, by its suffering no alteration by iodine, when by immersion in water the fovilla becomes protruded. We can frequently convince ourselves of the existence of these little oil-drops, by treating with a diluted acid, whereby we can observe an evident flowing together of the same. Besides, we convert the very little oil-drops into large drops flowing together, when we gently stir dried pollen placed in water.

The third constituent of the fovilla is the easiest to recognise—namely, the starch: it is found in grains of different sizes and forms, and is sometimes present in very great quantity, but appears to be permitted to be at other times wholly absent. Generally the starch-grains, as well as the oil-drops of the same form, are distributed in the whole mass of the particular mucus, and the *Najas major* constitutes the only exception. We can best perceive theexistence of the starch-grains, when we press the pollen between two glass plates, and pour on it a little solution of iodine, without stirring the preserved mixture afresh. The starch-grain shows itself then with the blue colour of iodide of starch, which we, by this proceeding, can at once perceive. We may treat the pollen first with acid, and then bring in contact with the solution of iodine; while a part of the fovilla is being forced out, then begins round the expelled and coagulated mucus from which the acid has liberated some starch, the blue cloud by which the iodide of starch exhibits itself; and by degrees the whole of the starch becomes precipitated. The latter method is much to be preferred when it is sought to ascertain the existence of starch, as the observation of a very small quantity often fails by the first method. That the grains coloured blue are actual starch, is placed beyond doubt, by the diluted acid and iodine producing analogous appearances with the starch contained in other organs.

The little oil-drops and grains of starch constitute the so-called granules of the pollen, which in late times have become the object of different inquiries. These are the particles in which special motions were formerly pointed out, and this erroneous observation, caused an infusorial organization to be assigned to these granules, and they were called the spermatozoæ of plants. So extreme was our ignorance, that at the most, out of a little particle completely unorganized, imagination called into existence a new being, in which, motions having been perceived, we at once drew a comparison between the fovilla-grains and natural infusoria, of the smaller of which we as yet know nothing except their movements. Through R. Brown's discovery of the molecular motions, the motions of the granules, independent of infusorial life, was demonstrated to be possible, and the determination of their chemical properties at present, places them wholly in the category of molecular motions. However, both R. Brown, and Adolphe Brongniart, have described in the fovilla grains of higher vegetables, besides a change of place also a change of form, which they consider as an indication of a life-activity, and one of the strongest arguments for their comparison with spermatozoæ. The author considers this apparent change of form to be partly illusory, and partly produced by the streaming of the oil-drops.

Having thus described the constituents of the contents of the pollen, the author proceeds to treat of the membrane of this organ. The envelope, by which, in all plants without exception, the fovilla is surrounded, he divides into two kinds of membrane, one a simple membrane, and the other a skin of a compound construction. All plants do not possess both membranes, several have only one; on the other hand, there are plants whose pollen have three or even more membranes. In far the greater number of cases, however, there are present two well-marked transparent membranes, and these act in such a manner towards reagents, as to show that the kinds with three and four membranes, are produced solely by the doubling of one or two of these. As it is necessary to employ more exact language, than that of the inner and outer membrane, and so forth, the author designates the outer membrane *Exine*, the inner one *Intine*, the inner fold of the outer membrane *Intexine*, and the outer fold of the inner membrane *Exintine*.

The *Intine*, or inner membrane of the pollen, which in all cases covers the fovilla, immediately shows itself everywhere under the same circumstances: it remains as clear as water, an uncoloured, extremely delicate, perfectly transparent membrane; solution of iodine does not colour it; it becomes destroyed by concentrated sulphuric acid, and is as permeable as cellular tissue over its whole surface, although destitute of pores. When there is only one membrane present in the pollen, it has always manifestly the characters of the *Intine*, and it is thus seen to be far more indispensable than the *Exine;* it is, though unfrequently, found alone, but is always sure to possess the same characters. Only in two cases has the author seen it thickened, namely, in the *Carex precox* and in *Nerium*, in which it presented regular and defined spots.

Notwithstanding the little importance which the *Exine*, or outer membrane, appears to have in the business of impregnation, yet it is nearly to it alone, that the peculiar forms of the pollen are indebted. It is evident from our knowledge of the fovilla and *Intine*, that it would be impossible, if the *Exine* were removed, to distinguish the pollen of a great number of plants; while by the *Exine* alone we are enabled, in many instances, to recognise from what plants the pollen is taken.

The *Exine* is not like the *Intine*, one single membrane, but possesses a compound structure. Möhl, in his work on the pollen, originated the opinion that the *Exine* was formed out of undeveloped cells, cemented together by the gelatinous matter which fills up the intervals between them. In the beautiful work just mentioned, wherein Möhl has made known his important inquiries concerning this gelatinous matter, to which he has given the name of intercellular substance, there are three possible cases stated, by which the formation of the *Exine* can be explained. Möhl declares himself for the last, which is identical with the view already mentioned, but admits that a more enlarged experience may decide in favour of one of the other two cases. These other suppositions are, first, that the *Intine* may form on its outer surface the *Exine;* and secondly, that the same inner membrane, may secrete, on its outer surface, an external skin, which, adhering to the surrounding undeveloped cells, may constitute the *Exine.* The first case Möhl dismisses wholly: but the author states that, unfortunately, there are, in Möhl's delineations, no sufficient proofs of the new view which he advances; that the drawings on which the decision of the question rests, are either merely of portions, or too small for constructing a generalization. The author considers that his own observations have brought him much nearer to the explanation of the origin of the *Exine;* but he finds that no one of the already mentioned cases, uncomplicated and alone, is sufficient, but that this interesting envelope presents a great variety in the kinds of its formation.

The first results of his researches, contradicts Möhl's before-mentioned opinion in favour of one of the former cases, as it undoubtedly exemplifies the existence of a simple membrane as the origin of the *Exine.* In the usual way, by mere treatment with water, the isolated membrane, may occasionally, but with difficulty be demonstrated in the *Ruellia formosa*, and *Barleria longifolia.* We possess in concentrated sulphuric acid, however, a means of showing with facility, in many cases, a distinct membrane in the *Exine*, together with investitures of different kinds upon its surface. With the *Ruellia formosa* and *anisophylla*, *Beloperone oblongata*, *Eran-*

themum nervosum and *strictum*, *Barleria longifolia*, and many *Malvaceæ*, it is only necessary to moisten the pollen with concentrated sulphuric acid, and then to press between two glass plates; the whole *Exine* shows itself so, as plainly to be recognised, and demonstrates in this situation not only all its peculiarities of condition, which in no other way we can find out, but presents the isolated exhibition of the membrane and its coverings. These two constituents of the *Exine* have many characters in common, which the author mentions, previously to describing each individually.

The action of concentrated sulphuric acid, shows that a difference exists between the *Exine* and the *Intine*, and the general cellular tissue. By the long-continued action of the acid, the texture of the external appendages of the *Exine* becomes more obscure, but short maceration will render their general structure more distinct, and those points are best to select for observation, which can be most plainly distinguished when, after maceration in acid, they have been for some time excluded from the air by covering with water. The *Exine* frequently acquires by this treatment a fine purple-red colour, whereby the examination of its structure becomes facilitated. The more concentrated the acid, the deeper becomes the red; and, the more completely it is excluded by the water from the air, the darker will it change by degrees. Generally, the membrane and the external appendages conduct themselves alike; but cases occur when the first reddens itself, and the latter acquires a yellowish-brown colour, through the action of sulphuric acid.

The specific differences of the *Exine* depend on the nature of the external appendages spread over its surface. These consist in grains, or prickles, or warts, or a cellular lacework; and are most beautifully delineated in the plate attached to the author's paper.

The last chapter contains a classification of the various kinds of pollen. The author arranges them according to the number of membranes; whether there be one, two, three, or many present. But I have already extended this analysis

Jungermannia microscopica. T.

of Fritzche's paper to too great a length for the limits of this Journal. There are, however, sufficient materials to enable the reader to judge of its value, and probably to induce him to study it for himself.

V.—*On a New* BRITISH JUNGERMANNIA.

By DR THOMAS TAYLOR.

[*With a Plate.* TAB. XX.]

JUNGERMANNIA MICROSCOPICA.

Foliosa, exstipulata; caule tenuissimo, repente, vage ramoso; foliis distichis, emarginatis, rotundato-ovatis, convexissimis, marginibus suboccurrentibus, dorso celluloso-echinatis; fructu laterali; calycibus obovatis, ore contracto, subdenticulato.

J. microscopica, *Taylor in Flor. Hib. p.* 59.—(TAB. XX.)

HAB. In udis sylvaticis, septentrionem aspicientibus, super muscos et Jungermannias parasitica.

Oculis nudis vix cernenda, pallide virens, subpellucida. Caules bi-trilineares, gracillimi, subflexuosi, parce ramosi, hic illic fila pellucida, simplicia, brevia demittentes, quorum ope plantula subjectis committitur. Folia subdistantia, nisi arte explanata sint acuminata, cellulis eminentibus serraturas mentientibus dorso exasperata; perigonialia apice obtusiora, in gremiis unicam aut duplicem antheram rufescentem, ovatam claudentibus; perichætialia bina, calycis basi subappressa. Calyx tumidus, ex angusta basi obovatus, ecostatus, cellulis, æque ac folia, externe echinatus, foliis duplo procerior. Pedunculus pellucidus, transverse striatus, calycis longitudini vix æqualis. Capsula rotundato-ovata, pallide brunnea, apice in segmenta quatuor fissa, minime vero basin usque laciniata. Fila pauca, recta, capsulæ segmentorum apicibus adfixa. Semina haud visa.

At Gortagaree, in the wood on the roadside, between Kenmure and Killarney, on the 29th January, 1835, I found on the leaves of *Hypnum loreum*, this, perhaps the minutest, of British *Jungermanniæ*. Subsequent visits enabled me to detect a few calyces, out of one of which the capsule had protruded in January, 1839; but I have reason to suppose that it flowers all the year round. I have also met with it on *Hypnum curvatum*, on *Jungermannia Tamarisci*, and on *J. Mackaii*. The leaves have their margins so much incurved, as to present, not unfrequently, in the upper part, the outline of a cone, whose sides then appear the margins, when the projecting cellules look like serratures. But Mr W. Wilson, with his usual acuteness, has observed the true figure of the leaf which he found destitute of serratures; he likewise detected the emargination of the leaf, and showed that this could easily be exhibited by sliding a piece of mica over the leaf in water under the microscope. Without some such artifice it is difficult to be persuaded that the leaf is not entire.

This species is plainly allied to *J. minutissima*, and the small tribe to which this belongs, not only by the erect valves of the capsule joined at the base, but also by the involution of the lesser lobe of the leaf, the size of the plant, and the very similar places of growth in which they all occur. Yet the calyx is destitute of any plaits above, and tumid as a bladder filled with air: the more pellucid leaves and more delicate stems will keep it distinct, although there may be a great resemblance between the leaves of this species and of *J. minutissima*, especially the perigonial, which usually have an expanded *apex* to the larger lobe. The annexed figure is magnified to a very high degree; it would be impossible to represent any distinct resemblance of the natural size.

THOMAS TAYLOR.

TAB. XX.—*Fig.* 1. The magnified plant; *f.* 2. A transverse magnified section to show the convexity of the leaf, and the echination on its back; *f.* 3. A leaf magnified and pressed to show the notch between the lobes.

VI.—CONTRIBUTIONS *towards a* FLORA *of South America.—Enumeration of Plants Collected by* MR SCHOMBURGK, *in British Guiana.*—By GEORGE BENTHAM, ESQ., F.L.S., &c., &c.

(*Continued from Vol. III. page* 250.)

CAPPARIDACEÆ.

575. Physostemon *intermedium, Moric. Pl. Nouv. Amer.* 62. *t.* 42.—P. ambiguum, *Bong. in Mem. Acad. Petrop. ser.* vi. *v.* v. *t.* 3. Cleome Guianensis, *Aubl.—DC. Prodr.* i. *p.* 240.—Sands and savannahs of the Rupunoony, Corentyn, &c. *Schomburgk, n.* 204. Ceara, *Gardner, n.* 2394, and in other Brazilian collections.

Gardner's n. 2036, from Piauhy, is *P. tenuifolium,* Mart.; n. 1239 from Alagoas, and 2034 from Piauhy, are *P. rotundifolium,* Mart.; and n. 1449, and 2395, from Ceara, are also species of *Physostemon.*

576. Cleome *pungens,* Willd.—*DC. Prodr.* i. *p.* 239.—Rio Negro, *Schomburgk, n.* 916; Rio Janeiro, *Tweedie, n.* 1296; Pernambuco, *Gardner, n.* 916, and in various West Indian and Brazilian collections.

577. C. *aculeata,* Linn.—*DC. Prodr. v.* i. *p.* 241.—Pedrero on the Rio Negro, *Schomburgk, n.* 862.—French Guiana, *Leprieur.*

Gardner's n. 308, from the Organ Mountains, is *C. spinosa,* his n. 5 and 6, from Rio Janeiro, and 309 from the Organ Mountains; Tweedie's n. 1295, 1297, and 1298, from Rio Janeiro; and Cuming's n. 967, and 1043, from Lima, are species of *Cleome,* belonging to the section *Pedicellaria;* Gardner's n. 917, from Pernambuco, (the same as 1448 from Ceara), and n. 1238 from Alagoas; and Tweedie's n. 1293, and 1294 from Rio Janeiro, are species of the section *Siliquaria.*

578. Cratæva *acuminata, DC. Prodr. v.* i. *p.* 243.—British Guiana, *Schomburgk, n.* 341.

POLYGALACEÆ.

579. Polygala (Timutua) *Timoutou,* Aubl.—*DC. Prodr. v.* i. *p.* 328.—Sandy savannahs of Roraima, *Schomburgk.*—French Guiana, *Leprieur, Herb. Par. n.* 106.

580. P. (Timutua) *hygrophila, Humb. et Kunth.—DC. Prodr. v.* i. *p.* 327.—Sandy swamps, British Guiana, *Schomburgk, n.* 681.

581. P. (Timutua) *longicaulis, Humb. et Kunth.—DC. l.c.* Arid savannahs, British Guiana, *Schomburgk, n.* 166.—French Guiana, *Martin, Leprieur, Herb. Par. n.* 103.—*P. incarnata,* Aubl., or *P. adenophora,* DC., is probably the same species as this one, which varies much in the number and size of the leaves, and in the size and colour of the flowers. The outer sepals are membranous, and, as well as the carina and capsule, bear a few rather large glands.

582. P. (Timutua) *variabilis, Humb. et Kunth. DC. Prodr.* i. 328. British Guiana, *Schomburgk.*—French Guiana, *Leprieur, Herb. Par. n.* 103.

583. P. (Timutua) *appressa* (sp. n.); annua, glabra, eglandulosa, caule superne ramoso, foliis remotis linearibus acutis appressis subteretibus, racemis spiciformibus elongatis laxiusculis, alis obovatis capsulam late ellipticam vix superantibus, seminibus oblongis hispidis.—*P. scopariæ* affinis, differt floribus minoribus, capsulæ et foliorum forma, et radice annua. Flores albidi.—Moist savannahs, British Guiana, *Schomburgk, n.* 81.

584. P. (Timutua) *paludosa, St. Hil. Fl. Bras. Merid.* ii. 8.—Sandy savannahs, British Guiana, *Schomburgk, n.* 670. Bahia, *Salzmann, Blanchet, n.* 2706. South Brazil, *Tweedie, &c.*

585. P. (Timutua) *galioides, Poir.—DC. Prodr.* i. 329.—Sandy savannahs, Rio Branco, *Schomburgk, n.* 823.

586. P. (Senega) *violacea, Vahl.—DC. Prodr.* i. 330.—French Guiana, *Leprieur, Herb. Par. n.* 105; Bahia, *Salzmann;* Pernambuco, *Gardner, n.* 924.

587. P. (Senega) *mollis. Humb. et Kunth.—DC. l. c.*—British Guiana; *Schomburgk, n.* 260.

588. P. (Senega) *angustifolia, Humb. et Kunth.—DC. l. c.* —Savannahs British Guiana; *Schomburgk.*

589. P. (Senega) *camporum* (sp. n.); annua, caule erecto subramoso brevissime puberulo; foliis lanceolato-linearibus

glabris v. vix puberulis, racemis gracilibus laxiusculis, alis late obovatis breviter unguiculatis, carinæ nudæ lobis lateralibus plicatis, stylo geniculato simplici apice substigmate oblique globoso penicillato, capsula oblonga emarginata glabra.—Caules 1—2-pedales. Folia inferiora lanceolata, vix pollicaria, obtusiuscula, superiora angustiora, acuminata, usque ad 3 pollices longa. Racemi laterales, 2—3-pollicares. Pedicelli setacei, floribus subæquilongi. Flores iis *P. violaceæ* structura similes sed minores, rosei. Calycis sepala exteriora postica ultra medium connata. Alæ corolla vix longiores, capsula matura latiores. Semina *P. violaceæ*, retrorsum hirsuta, caruncula fere orbiculata. Dry savannahs of the Rio Branco; *Schomburgk, n.* 816.—Gardner's *n.* 2044, from Piauhy, is probably the same species; and 1452, from Ceara, differs slightly in the more hairy stem. The same collector's *n.* 316, from the Organ Mountains, is *P. laureola* St Hil., and 2043, from Piauhy, is *Monnina cuneata*, St Hil. There are besides in Gardner's collections, a considerable number of *Polygalæ*, chiefly of the section *Timutua*, and several of them new.

590. Catocoma *lucida, sp. n.*—Dry savannahs, Pirara; *Schomburgk, n.* 717.

CATOCOMA (gen. nov.)—*Comespermata Americana* auctorum.—CHAR. GEN.—Calyx 5-sepalus, deciduus; Sepala 3 exteriora parva, uno postico, duobus anticis, 2 interiora majora alæformia. Petala basi columnæ stamineæ adnata; anticum magnum, carinæforme, trilobum; 2 postica oblonga; 2 lateralia minutissima, squamæformia. Stamina 8, ultra medium monadelpha, tubo postice fisso; antheræ uniloculares, apice poro dehiscentes. Ovarium a latere compressum; ovula in loculis solitaria, a dissepimenti apice pendula. Stylus terminalis, curvatus, deciduus, apice emarginatus, in emarginatura stigmatifer. Capsula compressa, oblongo-cuneata, subcarnosa, bilocularis, margine loculicide dehiscens. Semina in loculis solitaria, pendula, caruncula umbilicali pilis longissimis semen totum involventibus comosa.—Frutices Americani laxi vel scandentes, habitu et floribus *Securidacæ* similes,

ramis angulatis, foliis alternis ovatis oblongisve coriaceis penninerviis, floribus albidis v. flavicantibus paniculatis breviter pedicellatis, pedicellis basi bibracteolatis in axilla bracteæ bracteolis subsimiles.

The American plants referred to *Comesperma* are so very different in habit from the original Australian species of that genus, that one would be tempted on that ground alone to consider them as distinct, even were there not characters in the structure of the flower and fruit which appear to me to be important. The corolla of *Catocoma* is that of a *Securidaca*, the two minute scale-like petals placed at the base of the staminal tube being observable in all the species I have examined of both genera; whilst in the true Australian *Comespermata*, the corolla and staminal tube, as in *Polygala*, are much more membranous and closely connate without any trace of the lateral petals. The general resemblance in the form of the fruit, which probably induced the combining the American with the Australian genus, disappears in a great measure on a close examination. The fruit of *Catocoma* is oblong cuneate, always somewhat fleshy, the seed occupies a great portion of the length of the cell, its carunculus is small, placed at one extremity, and the long hairs which envelop the seed, proceed from the hilum, and are totally distinct from the shorter ones which clothe the seed as in most *Polygalaceæ*. In *Comesperma*, on the other hand, the fruit is spathulate, narrowed into a long kind of stipes at the base; the seed is small, placed at the apex of the cell, the carunculus is linear, extending nearly half way round the seed, and the coma consists merely of the hairs which clothe the testa, and which in this genus are of an extraordinary length.

The following are the species of *Catocoma* which I have examined:—

1. C. *floribunda*; scandens, foliis supra glabris subtus puberulis v. demum glabratis, paniculis tomentellis amplis floribundis vix foliatis, alis extus glabris intus puberulis, ovario ovato villoso, stylo leviter incurvo, capsula sericeo-canescente

—*Comesperma floribunda*, St Hil. Fl. Bras. Merid. ii. 55. t. 91.—Ceara; *Gardner*, *n*. 1455, and Piauhy, *n*. 2041.

2. C. *laurifolia;* scandens, foliis supra glabris subtus puberulis v. demum glabratis, paniculis laxis foliatis, alis dorso glabris, ovario obovato glabro, stylo longe geniculato, capsula glabra. *Comesperma laurifolia*, St Hil. l. c. ii. 56.—Pernambuco; *Gardner*, *n*. 923. Brasilia tropica; *Sellow*.

3. C. *lucida* (supra); fruticosa, foliis supra glabris subtus tomentoso pubescentibus v. demum glabris, paniculis foliatis, sepalis omnibus dorso puberulis, ovario ovato glabro, stylo geniculato, capsula glabra.—Frutex 12—15-pedalis. Ramuli dense tomentosi. Rami glabrati. Folia juniora utrinque tomento mox deciduo pubescentia. Flores minores quam in *C. laurifolia*, ex flavo et albo variegati. Ovarium et stylus ut in icone *C. Kunthianæ*. Capsula oblonga, 7—9-lin. longa, basi parum angustata.—A specimen gathered by Mr Lockhart in Trinidad, differs slightly from Schomburgk's, in a somewhat shorter and more emarginated capsule.

4. C. *Kunthiana*.—*Comesperma Kunthiana, St Hil. l. c.* ii. 54. *t*. 90.—Of this I have only a specimen in fruit from Rio Janeiro, and have therefore not examined the flowers. They are however fully described in the work quoted.

5 C. *brevifolia;* fruticosa, foliis late ovatis obovatisve utrinque tomentoso-pubescentibus, supra demum glabris, panicula oblonga densa, alis obovatis dorso glabris, ovario ovato villoso, stylo incurvo, capsulis basi longe angustatis glabris.—Serra Acurua in the province of Bahia; *Blanchet*, *n*. 2926, and Villa do Barra on the Rio Negro, *n*. 3089 of the same collector.

591. Securidaca *marginata* (sp. n.); scandens, foliis ovatis obtusis marginatis basi cordatis utrinque ramisque glabris, panicula laxa vix tomentella, alis maximis late orbiculatis, carinæ lobis brevissimis, lateralibus latissimis margine plicatis, intermedia minuta fimbriata.—Specimen unicum, foliis margine incrassatis ab omnibus distinctum. Flores in genere majusculi, rosei. Petala antica obovata, unguiculata. Fructus junior lateraliter inappendiculatus est; maturum non vidi. —Banks of brooks and rivers, British Guiana, *Schomburgk*.

592. S. *latifolia* (sp. n.); scandens, foliis ovatis emarginatis basi late obtusis supra glabris subtus tenuissime tomentellis, panicula laxa tomentella, alis maximis late orbiculatis glabris, carinæ lobis lateralibus latissimis margine subplicatis, intermedia erecto-recurva fimbriata cristæformi a dorso libera.—Pirara; *Schomburgk, n.* 714, in some sets.

593. S. *pubiflora* (sp. n.); scandens, foliis ovatis v. ovali-oblongis obtusiusculis basi rotundatis angustatisve supra glabris subtus vix puberulis, panicula tomentella, alis obovato-orbiculatis in unguem angustatis extus pubescentibus, carinæ lobis lateralibus orbiculatis, intermedia parva reflexa dorso subadnata complicata cristato-fimbriata.—British Guiana, *Schomburgk, n.* 714, in some sets.

594. S. *pubescens, DC. Prodr. v.* i. *p.* 341.—*Deless. Ic. Sel.* iii. *t.* 22.—French Guiana, *Herb. Par. n.* 55.

Gardner's n. 10, from Rio Janeiro is *S. lanceolata,* St Hil.; n. 922 from Pernambuco is very near to that species, and to *S. mollis,* Humb. et Kunth, but appears different from either; it is also in Salzmann's Bahia collection; n. 1456 of Gardner's Ceara collection is very near to *S. divaricata,* Mart., if not the same species.

Amongst the Sierra Leone plants collected by Mr G. Don for the Horticultural Society, are two *Polygalaceæ,* allied to *Securidaca,* which tend much to elucidate the true structure of the flower in this order, as noticed by R. Brown, who alludes to one or both of them as an undescribed genus in his Appendix to Flinders' Voyage, (*Verm. Schr.* i. 28.) These plants have since been published by G. Don, (*Gen. Syst.* i. 370), under the name of *Carpolobia,* a genus in which he has comprised a leguminous plant, (*Delaria,* Desv.; *Carpolobia dubia,* G. Don), and a fourth species unknown to me, perhaps a *Securidaca.* As the generic character drawn up partly from one, partly from another, of these heterogeneous plants, is wholly unintelligible, and not applicable to any one species, I take this opportunity of subjoining an amended character derived from the two which I have examined, and which I believe to be G. Don's *C. lutea* and *C. alba.*

Calyx 5 sepalus, deciduus, sepalis inæqualibus, interioribus

majoribus. *Petala* 5, basi tubo stamineo adnata, postica et lateralia oblonga, in unguem angustata, inter se subæqualia, anticum amplum, carinæforme, integrum v. apice brevissime cristato-lobatum. *Stamina* 5 fertilia, filamentis basi in tubum coalitis, apice longe liberis, antheris unilocularibus apice transversim dehiscentibus, filamenta sterilia brevia 1—3 inter fertilia interjecta. *Ovarium* oblique oblongum inæqualiter biloculare, ovulis in quoque loculo solitariis pendulis. *Fructus* carnosus, globoso-trigonus, abortu unilocularis. *Semen* pendulum, estrophiolatum, pilis longis sericeis sursum (versus hilum) tendentibus obtectum. *Albumen* carnosum. *Cotyledones* foliaceæ, tenues. *Radicula* brevis ad hilum spectans.—*Frutices* Africæ tropicæ, foliis (*Securidacæ*) ovatis acuminatis, racemis brevibus axillaribus paucifloris.

595. Krameria *ixina, L. DC. Prodr. v.* i. *p.* 341.—A single specimen in fruit only, gathered by Schomburgk in the expedition to Roraima.—Gardner's n. 2042, from Piauhy, is *K. latifolia*, Moric., and n. 925, from Pernambuco, is a species allied to *K. tomentosa*, St Hil., but probably new.

DROSERACEÆ.

596. Drosera *dentata* (sp. n.); foliis radicalibus brevissime petiolatis subexstipulatis orbiculato-spathulatis, apice obtusissime dentato-ciliatis, supra margineque ciliato-glandulosis, scapo erecto tenui glabro foliis rhachique multoties longiore, calycibus profunde 5-fidis obtusis glanduloso-pubescentibus. —Species pusilla. Folia vix semipollicaria, petiolo brevissime dilatato margine prope basin utrinque ciliis 1—2 eglandulosis aucto. Stipulas præter cilias petioli nullas video. Scapus gracilis, 4—6-pollicaris. Flores 3—5. Bracteæ brevissimæ. Pedicelli breves. Laciniæ calycinæ oblongæ, obtusæ. Stylus 5-partitus, stigmatibus brevissime penicillato-multifidis. Semina ovoidea, leviter tuberculata.—Moist savannahs, British Guiana, *Schomburgk, n.* 102.

VIOLACEÆ.

597. Calyptrion *Aubletii, Ging. in DC. Prodr. v.* i. *p.* 289. British Guiana, *Schomburgk, n.* 214 in the earlier sets.

598. C. *nitidum* (sp. n.); caule albo-punctato, foliis obovato-oblongis acutiusculis serratis basi angustatis, supra glabris nitidis, subtus sparse pubescentibus, sepalis ovato-lanceolatis ciliatis.—Folia minora quam in *C. Aubletii*, non acuminata. Flores multo minores tenuiores.—British Guiana, *Schomburgk, n.* 214, in the later sets.

599. Ionidium *Ipecacuanha, Vent.—St Hil. Fl. Bras. Merid. v.* ii. *p.* 144.—*Pombalia Itubu, DC. Prodr. v.* i. *p.* 307.—Dry savannahs, British Guiana, *Schomburgk n.* 687. French Guiana, *Leprieur, Herb. Par. n.* 113, Piauhy, *Gardner, n.* 2039.—Gardner's n. 1241 from Alagoas, n. 2037, 2040, from Piauhy, and n. 2397, from Ceara, are all closely allied to this species.

600. I. *oppositifolium, Rœm. et Schult. Syst. v.* v. *p.* 395.—*I. angustifolium, Humb. et Kunth.—DC. Prodr. v.* i. *p.* 309? Banks of the Rupunoony, *Schomburgk, n.* 121.

Gardner's n. 313, from the Organ Mountains, and n. 2038, from Piauhy, are also species of *Ionidium.*

601. Amphirrox *longifolia, Spr. Syst. cur. post.* 99.—*Spathularia longifolia,* St Hil.—S. Isabel on the Rio Negro, *Schomburgk.* French Guiana, *Martin.* Rio Janeiro, *Gardner, n,* 8.

602. Alsodeia *flavescens, Spr. Syst. v.* i. *p.* 806.—*Conohorea Passoura, DC. Prodr. v.* i. *p.* 312.—British Guiana, *Schomburgk, n.* 119, and 336.

603. A. *pubiflora* (sp. n.); foliis suboppositis ovato v. obovato-oblongis acuminatis subserratis, racemis simplicibus, rhachi ramulisque villosulis, pedicellis calyce longioribus, squamulis stamineis nullis, filamentis antherarum loculis æquilongis, ovulis lateralibus.—Folia et habitus *A. laxifloræ.* Racemi densiores, vix folio longiores. Flores minores pedicellis brevioribus. Petala extus pubescentia. Ovula in quaque placenta plura.—Banks of rivers, British Guiana, *Schomburgk, n.* 573.

604. A. *brevipes* (sp. n.); ramulis hispidis, foliis suboppositis oblongis v. ovato-oblongis acuminatis subserratis, racemis simplicibus folio brevioribus, pedicellis calyce brevioribus,

filamentis e squamula ortis, antherarum loculis brevioribus, ovulis adscendentibus.—Folia et habitus, fere *A. pubifloræ*, et *A. laxifloræ*. Folia sæpius longiora. Racemi folio multo breviores. Bracteæ et sepala pubescentia. Petala glabra. Ovula in quaque placenta 1—2. Banks of the Rio Quitaro, *Schomburgk, n.* 574.

605. A. *laxiflora* (sp. n.); ramulis hispidis, foliis suboppositis rarius alternis ovali-oblongis acuminatis, obscure crenato-serratis, racemis simplicibus laxis, pedicellis flores æquantibus, filamentis basi squamulatis antherarum loculis brevioribus, ovulis adscendentibus.—Frutex rarius divaricatus. Folia pleraque bipollicaria, nonnunquam 2½ v. fere 3 poll. longa. Racemi folio longiores, rhachi tomentosa. Pedicelli 2 lin. longi. Petala glabra.—Conohoria castaneæfolia, *Hook. Ic. Pl.* i. *t.* 63. *non St Hil.*—Banks of the Rupunoony, *Schomburgk, n.* 125.

606. A. *racemosa, Mart. in DC. Prodr. v.* i. *p.* 313.—Rio Negro, *Schomburgk, n.* 947.

Gardner's n. 7, and Tweedie's n. 1248, both from Rio Janeiro, are *A. physiphora*, Mart.—Gardner's n. 203, from Rio, is the Brasilian form of *A. Rinorea*, perhaps different from Aublet's plant.

607. Sauvagesia *elata* (sp. n.); herbacea, erecta, foliis oblongo-lanceolatis utrinque angustatis obscure serratis, floribus fasciculato-racemosis, sepalis ovali-oblongis seta terminatis, petalis spathulatis calyce brevioribus, filis numerosis.—Species magnitudine omnium partium distincta. Caulis, teste Schomburgkio, herbaceus, in speciminibus sublignosus videtur. Folia 3—4-pollicaria. Stipulæ semipollicares v. longiores, lanceolatæ, profunde setaceo-pinnatifidæ. Racemi 4—6-pollicares, ipsi aphylli, ad apices ramulorum v. in axillis foliorum superiorum paniculam foliatam formantes. Pedicelli nunc solitarii, sæpius plures fasciculati, bracteolis setaceo-multifidis pedicello brevioribus suffulti.—Flores dimidio fere majores quam in *S. erecta.* Petala angusta, fere unguiculata, decidua. Stamina persistentia, petaloidea petalis parum breviora, filiformia apice clavata iis dimidio breviora,

petaloideis subæquilonga. Capsula ovoidea, calyce parum longior. Semina numerosa, scrobiculata.—Edges of brooks, British Guiana, *Schomburgk, n.* 235.

608. S. *erecta, L.—DC. Prodr. v.* i. *p.* 315.—Islands of the Essequibo, savannahs of Anna-y, &c., *Schomburgk, n.* 9, 163, and 376, French Guiana, *Leprieur, Herb. Par. n.* 108; Peru, *Mathews, n.* 1995; Pernambuco, *Gardner, n.* 920, and in almost all Brazilian collections.

609. S. *Sprengelii, A. de St Hil. Fl. Bras. Merid. v.* ii. *p.* 152.—Arid savannahs of Anna-y, *Schomburgk, n.* 162. French Guiana. *Leprieur, Herb. Par. n.* 107, and in *Salzmann's* and other Brazilian collections.

610. S. *tenella, Lam.—DC. Prodr. v.* i. *p.* 316.—French Guiana, *Leprieur, Herb. Par. n.* 110.

Amongst the plants collected by Martin in French Guiana, are specimens of two species, one of which has been referred, in a set received by Sir W. J. Hooker from Mr Lambert, to the *Paypayrola* of Aublet. Upon examination, however, notwithstanding some general resemblance in habit, it proved to be a totally different plant, and as the two species in question appear to form a new genus amongst the parietal orders, allied in some respects to *Violaceæ*, in other perhaps to *Samydaceæ*, I here subjoin the characters, in as far as I am able to give them without having seen the fruit.

PERICLISTIA.—CHAR. GEN.—*Sepala* 5, æstivatione imbricata, persistentia. *Petala* 5, cum staminibus hypogyna, lanceolato-linearia, convoluto-imbricata, crassa, per anthesin erecta, apice clausa et subconnata. *Stamina* fertilia 5; filamenta brevia in tubum connata, tubo inter antheras nonnunquam dentibus (staminibus sterilibus?) aucto; antheræ ad apicem tubi sessiles, introrsæ, biloculares, loculis longitudinaliter dehiscentibus. *Ovarium* sessile, oblongum, uniloculare, placentis tribus parietalibus, ovulis numerosis. *Stylus* simplex, stigmate obtuso.—*Frutices*, inflorescentia excepta, glabri. *Folia* alterna, breviter petiolata, integerrima, coriacea. *Stipulæ* integræ, lanceolatæ, deciduæ v. persistentes.

Flores in racemis brevibus terminalibus fasciculati, brevissime pedicellati. Bracteæ parvæ, fuscæ.—Sp. 1. *P. latifolia*, foliis ovato-ellipticis acuminatis basi parum angustatis, sepalis lato-ovatis pubescentibus, staminum tubo inter antheras dentifero.—Folia 6—8-pollicaria. Stipulæ deciduæ. Racemi vix pollicares. Bracteæ minimæ, ovatæ. Sepala valde inæqualia obtusissima, majora interiora 1½ lin. longa. Corolla 5 lin. longa, genitalia duplo superans, tenuis, basi incrassata. Petalum intimum superne conduplicatum, cætera valde imbricata, se invicem involventia. Ovarium glabrum, antheris æquilongum. Stylus antheras duplo superans.—2. *P. longifolia*, foliis oblongis acuminatis basi longe angustatis, sepalis ovali-oblongis obtusiusculis glabris, tubo stamineo inter antheras integro.—Folia 6—8-pollicaria, dimidio angustiora quam in præcedente. Stipulæ lanceolatæ, petiolo parum breviores, persistentes. Corolla tenuior et paullo longior quam in *P. latifolia*.

SAMYDACEÆ.

611. Casearia (Iroucana) *spinosa, Willd.?—DC. Prodr. v.* ii. *p.* 49? ramulis hirtellis, hinc inde spinescentibus, foliis ovatis breviter et obtuse acuminatis leviter serratis basi rotundatis angustatisve punctatis, pedicellis axillaribus glomeratis, calycibus 5-fidis obtusis pubescentibus, antheris 8 oblongo-linearibus, stigmate capitato.—Ramuli spinescentes pauci. Rami interdum omnino inermes. Stipulæ parvæ, deciduæ. Glomeruli florum sessiles, multiflori. Pedicelli flore longiores. Calyx circa 2 lin. longus. Antheræ non apiculatæ, glabræ. Stamina sterilia oblonga, obtusa, ciliata. Ovarium villosum, in stylum ovario ipso æquilongo angustatum. Stigma capitatum.—British Guiana, *Schomburgk, n.* 369.

Casearia is divided by Endlicher (Gen. *p.* 917.) into two primary sections, according to whether the stamens are below 20, or 24, and upwards; but here appears to be a mistake, as in the first section the sterile stamina are not reckoned, whilst they are included amongst the 24 to 30 stamina of the second

section. I would therefore join a portion of the last division of the first section with the second section, and divide the genus as follows:—

1. Hexanthera, *Endl.*—Stamina fertilia 6. Stylus indivisus.

2. Iroucana, *Aubl.*—Stamina fertilia 8. Stylus indivisus. Fructus crassus valde carnosus. Semina pulpa nidulantia.

3. Pitumba, *Aubl.*—Stamina fertilia 10 rarìus 12. Stylus indivisus. Fructus parvus, coriaceo-carnosus, epulposus. Folia sæpissime punctata.

4. Crateria.—Stamina fertilia 10. Stylus apice trifidus. Fructus coriaceus, subcarnosus, trigonus, epulposus. Seminum axillus multifidus. Folia punctata.

5. Piparea, *Aubl.*—Stamina fertilia 12—15 rarius 10. Stylus apice trifidus. Fructus ut in *Crateria.* Folia coriacea, impunctata.

There are no species hitherto described, with less than 6 fertile stamina, (or 12, including the sterile ones,) or with more than 15 fertile stamina, (or 30 altogether.)

612. C. (Iroucana) *brevipes* (sp. n.); ramulis tomentosis demum glabratis hinc inde spinescentibus, foliis ovatis breviter et obtuse acuminatis leviter serrato-crenatis basi rotundatis glabris punctatis, floribus axillaribus subsolitariis majusculis, sepalis membranaceis obtusis, antheris 8 ovatis, stylo brevi indiviso, stigmate capitato.—Rami crassi; ramuli interdum in spinas validas subfoliatas abeunt, stipulæ minutæ subpersistentes. Petioli breves. Folia 2—4-pollicaria. Pedicelli flore multo breviores, sæpissime solitarii, nonnunquam bini v. terni. Alabastri tomentelli. Calyces patentes, 6 lin. diametro. Stamina alte connata; filamenta glabra, staminibus sterilibus parum longiora, antheræ ovatæ, non apiculatæ, glabræ; stamina sterilia lata, truncata, ciliata. Ovarium villosum. Capsula crassa globosa. Semina in quaque placenta 1—2 axillus lacerus, at non ut in *Crateria*, comosus. —Savannahs, Pirara; *Schomburgk, n.* 773.

A species which I have from Martin's Guiana collection, from Salzmann's Bahia collection, and from Alagoas, *Gard-*

ner, n. 1267, has the leaves as figured by Aublet, in his *Iroucana Guianensis*, from three to five inches long, with the fruit three or four lines in diameter. Vahl reduces the *Iroucana* to his *C. ramiflora*, from St Croix, but describes the leaves as two inches long, and the fruit as of the size of a grain of pepper. The two are therefore perhaps distinct. Gardner's n. 2312, which I have in fruit only, is probably an undescribed species of this section. Blanchet's n. 3119, from Villa do Barra, is very near Aublet's *Iroucana*, but has much larger stipules, smaller flowers, and the anthers very short and apiculated.

613. C. (Pitumba) *macrophylla, Vahl.—DC. Prodr. v.* ii. *p.* 50.—French Guiana, *Herb. Par. n.* 95 and 96.—*C. mollis*, of Humb. and Kunth, is closely allied to this species, and scarcely differs but in the hairiness of the leaves.

614. C. (Pitumba) *stipularis, Vent.—DC. Prodr. v.* ii. *p.* 50.—Rocky situations, Pirara; *Schomburgk, n.* 704. I have it also from the West Indies, and from Brazil. *Gardner's n.* 1524, and 1525, from Ceara, appear to be both of them the *C. grandiflora*, St Hil.—*C. hypoleuca*, Mart. is closely allied to the above two species.

615. C. (Pitumba) *petræa* (sp. n.); foliis ovali-ellipticis acuminatis mucronato-serrulatis basi rotundatis utrinque ramulisque rufo-pubescentibus punctatis, floribus parvis, umbellis axillaribus sessilibus, calyce tomentoso 5-fido laciniis ovato-orbiculatis, staminibus fertilibus 10 calyce paullo brevioribus, stylo indiviso.—A descriptione *C. hirsutæ* differt umbellis axillaribus, laciniarum calycis forma, etc.; a *C. rufescente*, St Hil. foliis majoribus supra pubescentibus aliisque notis. Frutex est. Folia 3—4-pollicaria, utrinque præsertim subtus molliter pubescentia, crebre punctata. Flores multo minores quam in *C. stipulari*, majores quam in *C. parviflora*. Filamenta sterilia angusta, hirta; fertilia glabra. Antheræ breves, connectivo apiculatæ, et pilis paucis brevibus ciliatæ. Ovarium pubescens, stylo brevi, stigmate capitato.—Stony savannahs, Pirara, *Schomburgk, n.* 718.

Of the section *Pitumba*, I have also examined Gardner's n. 348, from the Organ Mountains, which may be *C. pauci-*

flora, St Hilaire; Mathew's n. 1649, from Peru; Gardner's n. 1409, from Alagoas; and n. 1527, from Ceara; Blanchet's n. 2824, from Serra Acurua, and *C. sylvestris*, from Martin's Guiana collection.

Gardner's n. 961, from Pernambuco, is a narrow-leaved form of *C. parviflora.* Some specimens I have from Jamaica, have the leaves rather broader; and in Wydler's Porto Rico specimens, they are twice as large, being five to six inches long, and two to three broad. In all these the style is not perceptibly divided, and the stigmata are almost confluent, thus placing the species amongst the true *Pitumbas;* but in Sellow's Brasilian specimens, the style is evidently trifid as described by St Hilaire, and as observable in other *Craterias,* I am therefore inclined to think that two species have been confounded under the name of *C. parviflora.* I have only seen the fruit in Sellow's specimens.

Gardner's n. 160, and Tweedie's n. 1153, both from Rio Janeiro, belong to a species allied to, but perhaps again distinct from, either of the two above-mentioned. The leaves are firmer, the flowers larger, and the stamens longer. The style is shortly trifid.

616. C. (Crateria) *carpinifolia* (sp. n.); ramulis tomentellis demum glabratis, foliis ovatis v. ovali-oblongis acuminatis serrulatis basi rotundatis v. vix angustatis utrinque glabris crebre punctatis, umbellis sessilibus, floribus pubescentibus 5-fidis, staminibus fertilibus 10, calyce parum brevioribus, filamentis ciliatis, antheris ovato-globosis, stylo trifido.—*C. inæquilateræ* affinis, sed folia basi subæqualia, minus nitida, et flores duplo majores. Folia 1½—3-pollicaria. Pedicelli graciles, petiolo æquilongi. Calyx fere 1 lin. longus, laciniis orbiculatis ciliatis dorso pubescentibus. Fructus non vidi.—Skirts of wooded savannahs, *Schomburgk, n.* 103, and 263.—Ceara, *Gardner, n.* 1528, and Piauhy, *Gardner, n.* 2455.

Gardner's n. 336, from the Organ mountains, is *C. inæquilatera*, St Hil.; n. 335, from the same station, is a new one belonging to the same section.

617. C. (Piparea) *Javitensis, Humb. et Kunth.—DC. Prodr. v.* ii. *p.* 51.—Gathered on the Rio Quitaro, and in the expedition to the Orinoco; *Schomburgk, n.* 592, and 996.

618. C. (Piparea) *densiflora,* (sp. n.); foliis brevissime petiolatis ovali-ellipticis breviter et late acuminatis obscure crenatis utrinque glabris coriaceis nitidis impunctatis, floribus axillaribus subsessilibus capitato-congestis dense pubescentibus 12—15-antheris rarissime 10-antheris 5-fidis, stylo trifido.—Arbor parva v. frutex elata. Ramuli juniores puberuli. Folia 3—4-pollicaria. Stipulæ lanceolato-lineares, deciduæ. Flores albi, in axillis numerosi, fere omnino sessiles. Calycis laciniæ ovato-oblongæ, obtusæ, extus dense sericeo-pubescentes, intus glabriusculæ. Stamina fertilia calyce longiora, glabra; sterilia brevia, lineari-spathulata, villosa. Ovarium villosulum. Stylus glaber, longitudine staminum, stigmatibus ad apices ramorum capitatis.—British Guiana; *Schomburgk, n.* 143, and 386.

619. C. (Piparea) *laurifolia* (sp. n.); foliis brevissime petiolatis ovali-oblongis longiuscule acuminatis integerrimis v. vix serrulatis utrinque glabris coriaceis nitidis impunctatis, floribus axillaribus glomeratis dense pubescentibus 12—15-antheris 5-fidis, pedicellis calyce vix brevioribus.—*C. densifloræ* simillima et forte mera varietas, foliorum forma et floribus pedicellatis diversa.—British Guiana; *Schomburgk, n.* 140, and 342.

I have more or less examined, besides the above, eight species belonging to the section *Piparea,* viz:—*C. Commersoniana,* St Hil., (which is Gardner's n. 21, and is in Tweedie's, and other Rio Janeiro collections); Gardner's 960, and 1144 from Pernambuco, 1268 from Alagoas, and 1526 from Ceara; Cuming's 1274 from Panama, and two other Brasilian species in Pohl's collection. I have however only seen the fruit in four of these species.

BIXACEÆ.

620. Bixa *Orellana L.—DC. Prodr. v.* i. *p.* 259.—"Wild Arnotto."—Banks of Rivers, British Guiana; *Schomburgk, n.* 170.

621. Mayna *paludosa* (sp. n.); glabra, foliis elliptico-oblongis integerrimis longe acuminatis, racemis petiolo brevioribus ramulisque junioribus viscidulis, calyce glabro viscoso, petalis sex calycem æquantibus.—Frutex orgyalis. Folia 6—10-pollicaria, margine interdum sinuato-undulata, acumine angusto pollicari. Petiolus 1—1½-pollicaris, apice incrassatus. Stipulæ minutæ, subulatæ. Racemi 10—12-flori. Pedicelli solitarii v. rarius bini, 2—3-lin. longi, e tuberculo glanduloso post flores delapsos persistente orti. Flores plerique masculi, hinc inde pauci ad apices racemorum hermaphroditi. Sepala 3, late ovata, obtusissima, concava, 2 lin. longa, petaloidea, alba, æstivatione valde imbricata. Petala semper sex vidi, oblonga, obtusa, sepalis subæquilonga, æstivatione imbricata. Stamina circa 20, petalis subæquilonga; filamenta antheris breviora; antheræ oblongo-lineares, biloculares, loculis apice breviter solutis et demum divergentibus, rima longitudinali ab apice fere ad basin dehiscentibus. Ovarium in floribus hermaphroditis sessile, subglobosum, glabrum, leviter costatum, costis transversim in granulas divisis. In floribus masculis ovarii vestigium nullum. Stylus simplex, staminibus parum longior, glaber, apice brevissime trilobus, lobis margine stigmatiferis. Placentæ tres, parietales, ovulis numerosis. Fructus globosus, indehiscens, grosse tuberculatus, 6 lin. diametro, abortu monospermus?—Lagoons at Pedrero on the Rio Negro; *Schomburgk, n.* 920.

622. *M. laxiflora* (sp. n.); glabra, foliis oblongis utrinque angustatis acuminatis, racemis petiolo longioribus, petalis 8—9.—Folia angustiora quam in *M. paludosa*. Racemi sæpius bipollicares, visciduli, multiflori. Pedicelli semipollicares, solitarii bini v. bifidi. Flores magnitudine *M. paludosæ.* Sepala tenuiter membranacea. Stamina circa 30; filamenta antheris æquilonga. Ovarium *M. paludosæ.* Styli lobi breves, reflexi, acuti, apice stigmatiferi. Fructus globosus, 4 lin. diametro, coriaceo-carnosus, tuberculato-rugosus, indehiscens. Semen abortu unicum, hæmisphæricum, testa cornea, hilo magno, albumine copioso carnoso, embryone recto (orthotropo?)—*Omapitannau* of the Tamina Indians.

Gathered in the expedition to the Orinoco, in 2° N. latitude; *Schomburgk.*

In Martin's Guiana collection is a third new species of the interesting genus *Mayna*, which may be thus characterized: *M. denticulata*, ramulis petiolisque pubescentibus, foliis oblongo-ellipticis acuminatis margine remote calloso-denticulatis, petalis sex calyce duplo longioribus.

Gardner's 310 from the Organ Mountains, is the *Boca serrata* of the *Flora Fluminensis*, a species of *Banara*; his 1451 from Ceara is another *Banara;* 1476 from Ceara is a *Prockia.*

HOMALINEÆ.

623. Homalium *Racoubea, Sw.—DC. Prodr. v.* ii. *p.* 253. —Banks of Rivers, British Guiana; *Schomburgk, n.* 225.

TURNERACEÆ.

624. Turnera *ulmifolia L.—DC. Prodr. v.* iii. *p.* 346.—British Guiana; *Schomburgk, n.* 123, and 213.—Brazil; *Tweedie, Blanchet, n.* 2613, *Salzmann, &c.*

Gardner's n. 1026 from Pernambuco, is *T. trioniflora;* Sims, probably not distinct from *T. cuneiformis* Juss., which again is very near the very variable *T. ulmifolia.*

625. T. *opifera Mart. Reise,* 552.—*DC. Prodr. v.* iii. *p.* 346, (ubi mendo typographico *T. apifera* dicitur.)—Dry savannahs, Piràra; *Schomburgk, n.* 754.—Piauhy; *Gardner, n.* 2175.

626. T. *Guianensis, Aubl.—DC. Prodr. v.* iii. *p.* 347.—Dry savannahs, British Guiana; *Schomburgk, n.* 105.—The leaves are generally nearly entire, and many are frequently without glands. The flowers, as in others of the first or petiolifloròus group, are sessile on the petiole of the floral leaf, which forms the third bract mentioned by Aublet, and has frequently two glands at its base. I am therefore inclined to think that *T. pinifolia,* St Hil., may be the same plant.

Gardner's n. 2180, from Piauhy, appears to be *T. capitata,* St Hil.; Blanchet's 3097, from Villa do Barra, is *T. hermannioides,* St Hil., Gardner's 1247, from Alagoas, 1471,

1667, and 2404, from Ceara, and 2062, 2171, and 2176 from Piauhy, are all probably new species of the petioliflorous group.

627. T. *aurantiaca* (sp. n.); fruticosa, foliis ovatis v. ovato-lanceolatis acutis serrato-crenatis basi rotundatis supra glabris subtus ramulisque parce strigoso-pubescentibus, petiolo biglanduloso, pedunculis axillaribus unifloris liberis, bracteolis ovali-oblongis foliaceis, calycibus strigoso-puberulis.—Folia 2—3-pollicaria. Pedicelli rigiduli, pollicares v. paullo longiores. Bracteolæ semi-pollicares, basi angustatæ, margine nonnunquam serraturis paucis notatæ. Calycis tubus bracteolis paullo longior, laciniæ lanceolatæ, longe acuminatæ, tubo longiores. Petala obovata, aurantiaca, calycis lacinias paullo superantia. Ovarium villosum. Styli 3, apice multifidi. Capsula bracteolis dimidio fere brevior, villosa, valvulis coriaceis usque ad basin fissis. Semina profunde sulcata.—Sandy plains on the Essequibo and Rupunoony; *Schomburgk*, *n*. 291.

628. T. *velutina* (sp. n.); fruticosa, foliis ovatis v. ovali-oblongis obtusis crenatis basi cordatis supra pubescentibus subtus ramulisque velutino-tomentosis, petiolo biglanduloso, pedunculis axillaribus unifloris liberis, bracteolis parvis subulatis, calycibus velutino-tomentosis.—Ramuli juniores tomento denso flavescentes, rami demum glabrati. Folia 1½—2½-pollicaria, crassiuscula, mollia. Stipulæ parvæ, setaceæ. Pedunculi vix semipollicares. Calyces 9—10 lin. longi, tubo laciniis parum breviore. Petala obovata, aurantiaca, lacinias calycinas superantia. Ovarium villosissimum. Styli 3, apice multifidi.—Among rocks, British Guiana; *Schomburgk*, *n*. 626.

629. T. *parviflora* (sp. n.); fruticosa, foliis ovatis v. ovali-oblongis acutiusculis serrato-crenatis basi cuneatis supra hirtellis subtus ramulisque tomentoso-villosis eglandulosis, floribus axillaribus subsessilibus solitariis, bracteolis linearibus, calycibus pilosis.—Frutex 6—8-pedalis, ramosissimus. Folia 1—2-pollicaria, odoratissima, petiolo 2—3-lin. longo. Pedicelli brevissimi, liberi. Bracteolæ 3—3½ lin. longæ. Calyces vix 4 lin. longi. Petala lacinias calycinas paullo super-

antia. Ovarium villosissimum. Styli 3, pilosissimi, apice glabri breviter fissi. Capsula villosa, bracteolis brevior.—I should have taken this for the *T. odorata* of Richard, with whose very short and imperfect diagnosis it agrees, but that Kunth states his *T. mollis* to be very near to *T. odorata*, which would lead one to infer that the latter is a petioliflorous species. *T. tomentosa*, Humb. et Kunth, may be the same as my *T. parviflora*, but that Kunth describes it as having hexamerous flowers. He saw however but one flower; and that may have been hexamerous by accident.—Savannahs of the Rupunoony; *Schomburgk.*—French Guiana, *Herb. Par. n.* 121.

The three preceding species, as well as Gardner's n. 2179 from Piauhy, which is I believe an undescribed one, belong to De Candolle's second group, with persistent bracteolæ, as in the *petioliflora*, but with free uniflorous axillary peduncles. De Candolle's third group has generally the inflorescence and habit of *Piriqueta*, and can only be distinguished from that genus by the inspection of the styles. I have no species of this group in the Guiana collections before me; but besides the West Indian *T. cistoides*, and several Brazilian ones, in my herbarium, I refer to it, as far as I can ascertain from my specimens, the Nos. 1665, 1666, 1668, and 2416 of Gardner, from Ceara, and 2172, 2174, and 2177 from Piauhy.

The T. *salicifolia*, St Hil., (which I have among Tweedie's Rio Janeiro plants, and is the *Corchorus grandiflorus*, Spreng., in my set at least, of Martius's Herbarium Floræ Brasiliensis,) the *T. sidæfolia*, St Hil., and Gardner's n. 2173 from Piauhy, a new species allied to the last mentioned one, are remarkable from their two or many-flowered peduncles. In other respects they agree with De Candolle's third group.

630. Piriqueta *villosa*, *Aubl.—DC. Prodr. v.* iii. *p.* 348.—Sands of the Essequibo; *Schomburgk, n.* 189. French Guiana; *Herb. Par. n.* 44, and probably Pernambuco; *Gardner, n.* 929; but in the latter instance the flowers of my specimen are all fallen off.

631. P. *lanceolata* (sp. n.); foliis subsessilibus lanceolatis

obtusiusculis remote serratis basi rotundatis supra tuberculoso-pubescentibus subtus molliter tomentosis.—Evidently very near to *P. tomentosa* of Humboldt and Kunth, with whose description it agrees in every respect, except that the leaves are more sessile, longer, and much rounded, or even nearly cordate at the base.—Banks of the Rupunoony; *Schomburgk, n.* 127, in some sets.

MALVACEÆ.

632. Pavonia *typhalea, Cav.—DC. Prodr. v.* i. *p.* 443.—On the Essequibo; *Schomburgk, n.* 137, and in several West Indian and Brazilian collections.

Gardner's n. 324, from the Organ Mountains, is a new species allied to *P. typhalea,* but remarkable for the solitary aristæ on each coccus; n. 322, from the same locality, is *P. sepium,* St Hil., or *P. flava,* Spreng., the number of leaflets of the outer calyx varying from five to eight on the same specimens, although it be most frequently even on Martius's specimens five or six.

633. P. *speciosa, Humb. et Kunth.—DC. Prodr. v.* i. *p.* 443.—Arid savannahs, Piràra, and on the Rupunoony, *Schomburgk, n.* 253.

Gardner's n. 2398, from Ceara, allied to this species, is, as far as I can ascertain from my imperfect specimens, the *P. pellita,* Humb. et Kunth.

634. P. *bracteosa* (sp. n.); fruticosa, molliter incano-tomentosa, foliis ovato-orbiculatis obtusis v. vix acuminatis basi profunde cordatis, floralibus sessilibus basi subcoloratis, floribus sessilibus, involucri foliolis linearibus apice uncinato reflexis, coccis 5 glabris.—Frutex 6—8-pedalis. Folia breviter petiolata, 1—2 poll. longa, crenata, reticulato-rugosa; utrinque pube molli præsertim subtus canescenti-tomentosa, minute pellucido-punctata. Stipulæ parvæ, setaceæ. Flores in apicibus ramulorum congestæ, foliis floralibus caulinis subconformibus at minoribus circumdatæ. Foliola calycis exterioris circiter 11, lineari-subulata hispida, apice lamina foliacea latiore reflexa supra basin affixa appendiculata, ca-

lyci interiori subæquilonga. Calyx interior late campanulatus, semi-5-fidus, laciniis ovatis, extus tomentoso-pubescens, intus fere glaber. Corolla ampla, glabra. Tubus stamineus in toto fere longitudine antherifer. Cocci membranacei, dorso dehiscentes, leves, monospermi.—Moist savannahs, British Guiana; *Schomburgk, n.* 68; Ceara; *Gardner, n.* 1458; Bahia; *Salzmann.* This is probably the plant described by A. de St Hilaire, as *P. sessiliflora,* but it cannot be the species to which that name was originally given by Kunth, as he expressly describes the ovary and cocci as hispid, besides that the form of the leaves is not the same.

635. P. *cancellata, Cav.—DC. Prodr. v.* i. *p.* 444.—Savannahs, British Guiana; *Schomburgh, n.* 273. Bahia; *Gardner, n.* 865; Piauhy, *Gardner, n.* 2049.

636. P. *angustifolia* (sp. n.); herbacea, erecta, tota pilis stellatis rufis hispida, foliis lanceolatis crenulatis inferioribus basi sublobatis, floribus ad apices ramorum aggregatis, calycis exterioris foliolis circa 10 subulatis, interiore paullo longiore laciniis ovatis, corolla ampla glabra, coccis reticulatis inermibus.—Folia rigidula, 2—3-pollicaria, distantia, utrinque uti caulis inflorescentia et calyces pilis crebris stellatis scabro-hispida. Flores in apices ramulorum 3—5, subcapitati. Pedicelli crassi, calyce breviores. Calyx 4 lin. longus. Petala sesquipollicaria. Tubus stamineus in toto fere longitudine antherifer, corolla paullo brevior; stigmata 10; genitalia tamen in flore unico manco vix rite examinavi. Cocci 5, nigricantes, rete elevato rugosi, dorso leviter carinati, monospermi, bivalvatim dehiscentes.—Swamps, Piràra; *Schomburgk, n.* 731.

Gardner's n. 1244, from Alagoas, and n. 1457, 1460, and 1461, all from Ceara, are likewise species of *Pavonia; n.* 932, from Pernambuco is *Lopimia malacophylla,* Mart.

637. Urena *Americana, Linn. fil. Suppl. p.* 308.—I have no doubt that most, if not all the South American *Urenæ* belong to this species; but it appears to me to be distinct from *U. lobata,* to which A. de St Hilaire refers it.—British Guiana; *Schomburgk, n.* 1007; French Guiana; *Herb. Par. n.* 126; Alagons, *Gardner, n.* 1242.

638. Paritium *tiliaceum, St Hil. Fl. Bras. Merid. v.* i. *p.* 256.—British Guiana; *Schomburgk, n.* 212.

639. Hibiscus *bicornis, G. F. W. Meyer.—DC. Prodr. v.* i. *p.* 449.—On the Essequibo; *Schomburgk.*

Gardner's n. 1243, from Alagoas, which is also in Salzmann's Bahia collection, and amongst Martin's plants from French Guiana, appears to be *H. furcellatus*, Desv.

640. Fugosia *campestris* (sp. n.); foliis integris ovato-v. lanceolato-oblongis junioribus utrinque stellato-tomentosis, adultis supra v. utrinque glabratis, calyce exteriore 8—10 phyllo, interiore longiore profunde 5-fido, ovario 3-loculari loculis 4-ovulatis.—Folia breviter petiolata, bipollicaria, acuta v. obtusa, basi rotundata v. angustata, venis lateralibus utrinque vix prominentibus. Stipulæ lineares, deciduæ. Pedunculi uniflori, folio breviores, bracteolis 2 prope basin sæpius aucti. Calycis exterioris foliola 3—5 lin. longa, linearia, inæqualia. Calyx interior 6—7 lin. longus, laciniis anguste lanceolatis extus tomentosis nigro-punctatis. Petala ampla, sesquipollicaria, extus tomentosa. Stigmata tria, subdistincta. Ovarium villosissimum. Capsula (nondum matura) villosa, calyce brevior, trilocularis, loculicide trivalvis, loculis 3—4-spermis, seminibus nudis.—Dry savannahs, Rio Branco; *Schomburgk, n.* 838.

Gardner's n. 1459, from Ceara, is *F. phlomidifolia*, St Hil.; n. 2399, from Ceara, is *F. heterophylla*, St Hil., (*Redutea*, Vent.); Blanchet's n. 2702, from Serra Jacobina, appears to be an undescribed species, allied to *F. heterophylla*, and Drummond's n. 44, from his third Texan collection, another undescribed species, not mentioned in the Flora of Torrey and Gray, as it was probably wanting in their set of Drummond's plants.

641. Abutilon *spicatum, Humb. et Kunth, Nov. Gen. et Sp. v.* v. *p.* 271.—Petala lutea. Capsulæ stellato-patentes, obtusissimæ.—Shady places, Rio Branco; *Schomburgk, n.* 845. Bahia; *Salzmann.*

642. A. *Lucianum, DC. Prodr. v.* i. *p.* 468, *sub Sida.*—Caulis herbaceus, tomento molli superne subfloccoso incanus. Folia fere *A. excelsi.* Panicula pedalis, anguste thyrsoidea

foliosa, floribus dense fasciculatis. Calyx tomentosus, major quam in *A. spicato.* Petala alba, calyce duplo majora. Stamina circa 20. Carpella 5, ovoidea, acuta, subinflata, erecta, demum glabriuscula, trisperma.—Sandy savannahs, Rio Branco, *Schomburgk, n.* 849.

Gardner's n. 319, from the Organ Mountains, is *A. rufinerve,* St Hil.; 321, is *A. striatum,* Dicks.; n. 318, and 320, all from the same locality, are also species of *Abutilon.*

643. Sida *glomerata, Cav.—DC. Prodr. v.* i. *p.* 460.—Habitus *S. carpinifoliæ,* distinguitur ramulis hirsutioribus, stipulis falcato-lanceolatis, calycibus ciliato-hirsutissimis, carpellis muticis v. brevissime et crassiuscule acuminatis.—British Guiana; *Schomburgk, n.* 122, and 499; French Guiana; *Herb. Par. n.* 118, 123, and 125, Trinidad; *Lockhart.*

Gardner's n. 11, from Rio Janeiro, is the true *S. carpinifolia,* Cav., a very common plant in Rio collections; the *S. carpinoides,* DC., which I have from the same district, and also from Madeira, communicated by Dr Leman, under the name of *S. carpinifolia,* and from continental botanic gardens under the names of *S. carpinifolia,* and *S. ulmifolia,* is readily known by the form of the carpels, with a spur on the inner edge besides the two points on the back.

644. S. *urens, Linn.—Cav. Diss.* i. *t.* 2. *f.* 7.—*DC. l.c.* —*S. rufescens,* St Hil. *Fl. Bras. Merid. v.* i. *p.* 185?—Capsulæ muticæ v. rarius brevissime birostratæ.—Savannahs of the Rupunoony, and Barcellos on the Rio Negro; *Schomburgk, n.* 946. French Guiana; *Leprieur, Herb. Par. n.* 117. Brazil from Bahia to Buenos Ayres; *Salzmann, Sello, Tweedie, &c.*

Gardner's n. 12, from Rio Janeiro, is *S. plumosa,* Cav.; n. 2052, from Piauhy, appears to be a broad-leaved variety of *S. anomala,* St Hil., a plant having evidently a wide range, and probably the same as *S. ciliaris,* Cav.

645. S. *linifolia, Cav.—DC. Prodr. v.* i. *p.* 459.—Savannahs about Anna-y; *Schomburgk, n.* 131, and in several Brazilian collections.

646. S. *rhombifolia, L.—DC. l.c.*—British Guiana, *Schom-*

burgk, n. 77.—French Guiana; *Herb. Par. n.* 120, and in almost all American collections.

647. A species of *Sida*, allied to *S. rhombifolia*, but a larger plant, with broader and more canescent leaves, larger and more canescent calyxes, and larger carpels. There are, however, many described species allied to *S. rhombifolia*, which are unknown to me, and I am unable to give any positive characters to distinguish this one.—British Guiana; *Schomburgk, n.* 476.

648. S. *althæifolia, Sw. β. aristosa, DC. Prodr. v.* i. *p.* 465. S. multiflora, *Cav. DC. l. c.* 464.—British Guiana; *Schomburgk, n.* 495. French Guiana; *Leprieur, Herb. Par. n.* 124. Alagoas; *Gardner, n.* 1246; Ceara, *Gardner, n.* 2400, and in many Brazilian collections. I have from the West Indies both of De Candolle's varieties.

Gardner's n. 323, from the Organ Mountains, n. 1465, and 1466, from Ceara, and n. 2485, from Piauhy, are all species of *Sida* allied to the three preceding ones; n. 1464, from Ceara, which I have also from the West Indies, appears to be *S. maculata*, Cav., a species remarkable for the large size of its flowers; n. 866, from Bahia, is *S. Alpestris*, St Hil., which is not probably to be distinguished from *S. floribunda*; Humb. et Kunth, and *S. paniculata*, Linn., the peculiarities ascribed to each supposed species, being found alike in the West Indian, the Peruvian, and the Brazilian specimens; n. 1467, from Ceara, is *S. micrantha*, St Hil.

649. Gaya *subtriloba, Humb. et Kunth, Nov. Gen. et Sp. v.* v. *p.* 270. *t.* 476.—The leaves in my specimen are none of them lobed, but it agrees in every other respect with Kunth's figure and description.—British Guiana; *Schomburgk, n.* 682.

Gardner's n. 1245, from Alagoas, n. 2053, from Piauhy, and n. 2401, from Ceara, belong to *Gaya*; n. 2486, from Piauhy, the same as Blanchet's n. 2642, from the Serra Jacobina, appears to be *G. aurea*, St Hil.; but my specimens are in flower only.

650. Malachra *capitata, L.—DC. Prodr. v.* i. *p.* 440.—British Guiana; *Schomburgk, n.* 889.

STERCULIACEÆ.

651. Quararibea *Guianensis, Aubl. Pl. Gui. v.* ii. *p.* 692. *t.* 278.—Banks of rivers, British Guiana; *Schomburgk, n.* 211. —The leaves are rather larger and broader than in Martin's Guiana specimens, which agree precisely with Aublet's figure and description; but they both are probably but one species.

652. Helicteres *guazumæfolia, Humb. et Kunth.—DC. Prodr. v.* i. *p.* 476.—British Guiana; *Schomburgk, n.* 198; *Cuming, n.* 1299.—This answers very well to Kunth's description; but it is perhaps not really distinct from *H. Baruensis,* Jacq., although the petals be spathulate and not linear. Gardner's n. 2058, from Piauhy, is again a slight variety of the same species, with rather broader bracteolæ, but differing in foliage and other points from *H. involucrata,* Moric.

653. H. *althæifolia, Lom. Dict. v.* iii. *p.* 88?—Ramuli crassi, uti pedicelli, calyces, fructus et pagina inferior foliorum tomento denso subfloccoso canescentes. Folia ovato-orbiculata, cordata, 4—6 poll. longa, 3—5 lata, breviter acuminata v. obtusa, duplicato-dentata, juniora utrinque cano-tomentosa, adulta supra viridia. Pedunculi breves, crassi; pedicelli brevissimi. Bracteæ lineares. Calyces 15—16 lin. longi, tubulosi, bilabiati, dentibus linearibus. Petala linearia, longe unguiculata. Gynophorum villosum, crassiusculum, per anthesin 2½ poll. longum, fructifer 4—5 pollicare. Stamina fertilia 10, sterilia interiora 5, lineari-cuneata. Fructus ovato-cylindraceus; dense tomentosus, capsulis apice subrectis, anfractibus multo paucioribus quam in *H. Jamaicense.*—Dry savannahs, British Guiana; *Schomburgk, n.* 727; Trinidad, *Lockhart.* Petals, according to Schomburgk, of a greenish white.

Gardner's n. 13, from Rio Janeiro, is *H. ovata, Lam.; n.* 2057, from Piauhy, and n. 2403, from Ceara, are species of *Helicteres,* both as I believe, undescribed.

654. Sterculia *Ivira, Sw.—DC. Prodr. v.* i. *p.* 483.—British Guiana; *Schomburgk, n.* 297.

BUTTNERIACEÆ.

655. Theobroma *bicolor, Humb. et Bonpl.—DC. Prodr. v.* i. *p.* 484.—On the Rio Negro; *Schomburgk, n.* 870.

Gardner's n. 933, from Pernambuco, is *Guazuma ulmifolia*, a plant occurring very frequently in Brazilian and West Indian collections.

656. Buttneria *scabra, Aubl.—DC. Prodr. v.* i. *p.* 487, *an Linn.? (Confer St Hil. Fl. Bras. Merid. v.* i. *p.* 143.)—The leaves are often longer and narrower than represented either in Aublet's or in Cavanille's figures.—Moist situations, Currassawaka; *Schomburgk, n.* 644.

657. B. *ramosissima, Pohl. Ic. v.* ii. *p.* 75. *t.* 149.—The leaves somewhat longer and narrower, and the panicle rather less branched than represented by Pohl.—Currassawaka; *Schomburgk, n.* 645.

658. B. *obliqua* (sp. n.); glabra, ramis teretibus aculeatis, foliis oblongo-lanceolatis obtusis v. breviter acuminatis subtus uniglandulosis inermibus, umbellis subsessilibus, tubi staminei lobis brevissimis, sterilibus ovatis obtusis.—Forma foliorum fere *B. tereticaulis*, fide icone Cavanillesiana, petiolus tamen multo brevior et inermis, limbus obtusior, basi sæpius inæquilaterus interdum subfalcatus. Flores glabri. Sepala lanceolata, acuta. Petalorum cuculli trilobi, lobis lateralibus brevibus oblongis obtusis divergentibus, intermedio calyce parum breviore glanduliformi ovali-oblongo acuto breviter unguiculato. Capsulam non vidi.—Rocks, Pedrero; *Schomburgk.*

Gardner's n. 1249, from Alagoas, and Blanchet's n. 2660, from Serra Jacobina, are scarcely distinguishable from St Hilaire's description of his *B. australis*, a species which had been referred to *B. tereticaulis* of Lamarck. All these are certainly very near to the above *B. obliqua*, yet a comparison of specimens shows that Schomburgk's plant is certainly specifically distinct from Gardner's and Blanchet's; nor do any of them quite agree with Cavanille's figure.

659. B. *divaricata* (sp. n.); ramis aculeatis tomentosis,

foliis ovato-cordatis acuminatis crenatis supra scabro-pubescentibus subtus tomentoso-pubescentibus triglandulosis subaculeatis, umbellis brevissime pedunculatis, tubi staminei lobis sterilibus orbiculatis, antheriferis brevissimis.—Frutex ramis laxis divaricatis. Folia 2—3-pollicaria, basi tricostata, glandula oblonga in quaque costa. Petioli 3—4 lin. longi. Umbellæ petiolo æquilongæ. Sepala ovato-lanceolata, extus pubescentia. Tubus stamineus et ungues petalorum breves. Antheræ inter lobis sterilibus subsessiles. Petalorum cuculli dilatati, dorso producti in lobum sepalis æquilongum apice glanduliforme ovatum acutum. Capsula junior echinato-tuberculosa, villosa.—British Guiana; *Schomburgk, n.* 205.

Gardner's n. 326, from the Organ Mountains; and n. 934, from Pernambuco, both appear to me to be new species of *Buttneria.*

660. Ayenia *tomentosa, L.—DC. Prodr. v.* i. *p.* 488.—Dry savannahs, Piràra; *Schomburgk, n.* 744. Bahia; *Salzmann.*

Blanchet's n. 2813, from the Serra Acurua, is very near to the above species, but has the leaves almost smooth on the upper surface; can it be the *A. sidæfolia, Lœfl.—DC. l.c.?*

661. Waltheria *involucrata* (sp. n.); fruticosa, incano-tomentosa, foliis ovato-cordatis acutis dentatis, cymis subsessilibus petiolo brevioribus, bracteolis connatis in involucra inflato-globosa membranacea ore crenata flores binos sessiles includentia.—Frutex elatus. Ramuli tomentoso-pubescentes, incani. Folia 2—3-pollicaria, utrinque molliter cano-tomentosa, petiolo fere pollicari. Involucra in quaque cyma sæpius 5 ad 7, florifera 3 lin. diametro, fructifera 4—5 lin., basi herbacea, apice membranacea, colorata (alba teste Schomburgkio), ore parum contracta, irregulariter crenata, extus venosa et cano-tomentosa. Bracteæ steriles in cyma paucæ, subulatæ. Flores intra involucra bina, sessilia, involucro æquilonga. Calyx anguste turbinato-tubulosus, cano-tomentosus, striatus, 5-dentatus. Petala cuneato-oblonga, calycem paullo superantia, ungue latiusculo margine undulato, dorso hispido. Staminum tubus brevis; filamenta petalis subæqui-

longa, leviter complanata et undulata; antheræ oblongæ. Ovarium hispidissimum, simplex, biovulatum. Stylus pilosus, stigmate profunde penicillato.—High banks of the Rupunoony; *Schomburgk, n.* 722.

Gardner's n. 2057, from Ceara, the same as Blanchet's n. 2744, from Utinga, is a new *Waltheria*, intermediate between this species and the *W. ferruginea*, St Hil.; the broad oblong or lanceolate bracteæ are frequently joined two or three together.

662. W. *viscosissima, St Hil. Fl. Bras. Merid. v.* i. *p.* 150. From the expedition to Roraima; *Schomburgk.* Ceara; *Gardner, n.* 1462. Bahia; *Salzmann* and *Gardner, n.* 868.

663. W. *paniculata* (sp. n.); caule suffruticoso velutino-tomentoso paniculato-ramosissimo, foliis oblongis obtusis irregulariter crenulatis basi leviter cordatis utrinque molliter sericeo-tomentosis, pedunculis folio longioribus, florum glomerulis densis secundis, bracteis ovatis oblongisve acutis, petalis glabris.—Habitus fere *W. viscosissimæ*, sed inflorescentia densior, floribus numerosissimis. Folia bipollicaria, petiolo fere semipollicari. Ramuli floriferi numerosi, paniculam foliatam formantes. Bracteæ numerosæ, imbricatæ, inferiores fere ovatæ, superiores anguste oblongæ, uti calyces pilis longis sericeis hirsutissimæ. Calyx tubuloso-campanulatus, membranaceus, breviter 5-dentatus. Petala calyce dimidio fere longiora, lamina basi angustata. Filamenta supra tubum stamineum brevia. Ovarium basi glabrum, apice hirsutissimum, biovulatum. Stigma breve, penicillatum. Capsula monosperma.—Moist savannahs, British Guiana; *Schomburgk, n.* 67, in the earlier sets.

Gardner's n. 930, from Pernambuco, is another paniculate species allied to the last, but differing in the leaves and bracts.

664. W. *Americana, L.—DC. Prodr. v.* i. *p.* 492.—British Guiana; *Schomburgk, n.* 67, in the later sets; French Guiana; *Leprieur, Herb. Par. n.* 127.

Gardner's n. 1248, from Alagoas, is *W. elliptica* of some authors, with smaller flowers and smooth petals. Cuming's

n. 1133, from Panama, appears to be *W. angustifolia* of Kunth, but perhaps not of Linnæus. All these, as well as *W. Indica*, are scarcely distinguishable from *W. Americana*. Gardner's n. 2056, from Piauhy, which is Blanchet's n. 2579, from Serra Jacobina; and Gardner's n. 2056*, from Piauhy, the same as Blanchet's n. 2691, from Serra Jacobina, appear both to be new *Waltheriæ*, of which genus there are also several undescribed species in Pohl's collection.

665. Melochia (Eumelochia) *fasciculata* (sp. n.); suffruticosa, ramis pubescenti-villosis, foliis breviter petiolatis ovatis oblongisve serrato-crenatis basi rotundatis utrinque hirsutis v. supra demum glabratis, florum glomerulis axillaribus terminalibusque subsessilibus, tubo stamineo breviter 5-fido, stylis hirsutissimis.—Suffrutex, ramis duris virgatis. Folia pleraque pollice breviora, nunc oblonga acutiuscula et basi subangulata, sæpius latiora utrinque obtusa, supra viridia, subtus vix canescentia. Flores in glomerulis 10—20, pedunculo pedicellisque brevissimis hirsutis. Bracteæ parvæ, subulatæ. Calyces ampli, hirsuti, laciniis lato-ovatis subulato-acuminatis. Corolla calyce duplo longior, alba, glabra. Petala longiuscule unguiculata. Capsula utrinque pyramidata, pubescens, angulis exterioribus acutis.—Dry savannahs, Piràra; *Schomburgk, n.* 738. Piauhy; *Gardner, n.* 2068; Utinga; *Blanchet, n.* 2750.

Gardner's n. 1472, from Ceara, is *M. pyramidata*; his n. 1250, from Alagoas, and n. 2061, from Piauhy, are *M. tomentosa*, a species which I have also from the West Indies, both belonging to the section *Eumelochia*, distinguished not so much by the dehiscence, so uncertain in many *Melochiæ*, as observed by St Hilaire, as by the form of the capsule. But even in this respect, besides the species mentioned by St Hilaire, an intermediate form is observable in Cuming's n. 1229, an apparently new species, allied to *Mougeotia inflata*, Humb. et Kunth, but with sessile anthers, a more inflated calyx, and more angular capsule.

666. M. (Riedleia) *arenosa* (sp. n.); caule suffruticoso prostrato? foliis longiuscule petiolatis ovatis acutis dupli-

cato-dentatis basi rotundatis subcordatisque junioribus utrinque cano-tomentellis supra demum glabratis, pedunculis axillaribus paucifloris petiolum subæquantibus, calyce laxo, tubo stamineo profunde 5-fido, capsulis globosis vix pentagonis loculicide et septicide dehiscentibus.—Rami crassiusculi; ramuli breves, cano-tomentosi. Folia vix pollicaria, tenuia, petiolo semipollicari. Bracteæ et stipulæ subulatæ. Flores in pedunculo sæpius tres. Calyces tomentosi, breves, lati et subintrusi, dentibus subulato-acuminatis tubo æquilongis. Petala 5 lin. longa, calyces plus duplo superantia, obovato-oblonga, breviter unguiculata. Tubus stamineus brevis; filamenta petalis tertia parte breviora. Ovarium villosum. Capsula pubescens.—Sandy banks of the Essequibo and Rupunoony; *Schomburgk, n.* 31 and 519. Piauhy; *Gardner, n.* 2489.

667. M. (Riedleia) *graminifolia, St Hil. Fl. Bras. Merid., v.* i. *p.* 160, *t.* 31.—Moist savannahs, British Guiana, and on the Rio Branco; *Schomburgk, n.* 805. Brazil; *Pohl.*

668. M. (Riedleia) *lanceolata* (sp. n.); herbacea, erecta, foliis remotis lanceolatis duplicato-serratis basi rotundatis cordatisve utrinque cauleque glabris, corymbo trichotomo terminali multifloro pubescente, capsulis globosis setosis loculicide et demum subsepticide dehiscentibus.—Herba erecta, bipedalis, inflorescentia excepta glaberrima. Folia 2—4-pollicaria, basi dilatata et interdum obscure sublobata. Flores in corymbo denso numerosi, magnitudine florum *M. graminifoliæ.* Pedicelli et calyces pubescentes et setis paucis apice glanduliferis hirti. Calyces et corolla *M. graminifoliæ.* Filamenta antheris duplo longiora. Capsulæ *M. graminifoliæ,* setis apice glanduliferis dense echinatæ.—In shallow water, British Guiana; *Schomburgk, n.* 362.

669. M. (Riedleia) *oblonga* (sp. n.); suffruticosa, foliis brevissime petiolatis oblongis v. oblongo-lanceolatis serratis basi rotundatis supra glabris subtus ad venas ramulisque pilis stellatis scabro-tomentellis, pedunculis in axillis supremis racemuliferis ad apices ramorum interrupte racemosis, tubo stamineo profunde fisso.—Suffrutex 4—5-pedalis. Rami

virgati. Folia 2—3-pollicaria, floralia minora remota, suprema ad bracteas reducta. Stipulæ lanceolato-subulatæ, deciduæ. Pedunculi inferiores 6—8 lin. longi, apice cymam brevem paucifloram ferentes; pedicelli breves, ex axilla bracteolæ parvæ lanceolatæ acuminatæ persistentis orti; pedunculi supremi brevissimi; flores ultimi in racemo brevi subspiciformi dispositi. Flores magnitudine *M. graminifoliæ*. Calyx late campanulatus, breviter et acutissime 5-fidus. Petala oblongo-linearia, glabra, calyce duplo longiora. Stamina glabra, petalis parum breviora, basi breviter monadelpha. Ovarium villosum, loculis biovulatis. Styli glabri. Capsulam non vidi.—Savannahs of the upper Rupunoony; *Schomburgk.*

670. M. (Riedleia) *ulmifolia* (sp. n.); suffruticosa, foliis petiolatis lato-ovatis acuminatis grosse serrato-crenatis basi truncatis v. vix cordatis supra pilis brevibus stellatis conspersis, subtus ramulis et inflorescentia tomentoso-pubescentibus, cymis sessilibus axillaribus laxiusculis multifloris, capsulis villosissimis septicide dehiscentibus.—Suffrutex 6-pedalis. Folia longiuscule petiolata, 4-pollicaria. Cymæ bi-trichotomæ, petiolum vix superantes. Calyces floriferi vix 2 lin. longi, late campanulati, extus tomentosi, lobis 5 brevibus acutis. Petala flava, obovato-oblonga, calyce longiora, basi in unguem angustata, pilosula. Stamina petalis dimidio fere breviora, glabra; filamenta complanata, basi breviter monadelpha; antheræ oblongæ, breves. Ovarium hispidissimum, loculis biovulatis. Styli glabri, staminibus æquilongi. Capsula 2 lin. diametro, in coccos 5 septicide secedens, coccis interdum demum breviter dehiscentibus. Semina sæpius in quoque cocco duo.—Savannahs, British Guiana, *Schomburgk, n.* 203.

671. M. (Riedleia) *melissafolia* (sp. n.); suffruticosa, (prostrata?) pubescens, foliis longiuscule petiolatis ovatis subcordatis serrato-crenatis tenuibus utrinque pilosiusculis viridibus, capitulis axillaribus sessilibus, bracteis linearibus ciliatis flore duplo longioribus, tubo stamineo profunde fisso, capsula loculicide et septicide dehiscente.—Rami duri; ramuli pilis brevibus sparsis pubescentes. Folia pleraque semipolli-

caria, majora pollice parum longiora, nunc fere orbiculata; nunc rarius ovato-oblonga, pilis longis simplicibus in pagina superiore sparsis, in inferiore secus venas dispositis. Petiolus pilosus limbo sæpe æquilongus. Capitula densa petiolo breviora. Bracteæ 3—4 lin. longæ. Calyces tenuiter membranacei, breviter 5-dentati. Petala calyce paullo longiora, breviter unguiculata, oblonga, glabra. Tubus stamineus brevissimus, filamenta petalis paullo breviora, antheræ subglobosæ. Ovarium villosissimum. Styli glabriusculi. Capsula depresso-globosa, vix pentagona, villosa, in semicoccos 10 loculicide et septicide dehiscens, columella persistente. Semina transversim plicato-rugosa et hispida.—Rocky situations.—British Guiana; *Schomburgk, n.* 366. French Guiana; *Leprieur, Herb. Par. n.* 122.

672. M. (Riedleia) *hirsuta*, Cav.?—Mougeotia hirsuta, *Humb. et Kunth, Nov. Gen. et Sp. v.* v. *p.* 331.—French Guiana; *Herb. Par. n.* 128. Bahia; *Salzmann.*—This answers in every respect to Kunth's description, but I have not compared it with Cavanille's figure, his sixth Dissertation being wanting in my copy.

673. M. (Riedleia) *vestita* (sp. n.); fruticosa, tota pilis longis sericeo-villosissima, foliis breviter petiolatis ovatis v. ovali-oblongis obtusiusculis serratis basi subcordatis, stipulis lanceolatis, floribus dense glomeratis, glomerulis spicatis paucisque axillaribus, bracteis lanceolato-linearibus calyce longioribus, tubo stamineo 5-fido.—Frutex humilis dense foliosus. Rami, foliorum pagina utraque, stipularum pagina inferior et inflorescentia pilis longis mollibus obtecta. Foliorum forma fere *M. hirsutæ.* Inflorescentia densior. Bracteæ longiores, hirsutiores. Corolla minor, petalis anguste oblongis. Filamentorum pars libera tubo longior, nec ut in *M. hirsuta*, brevissima subnulla. Stigmata glabra nec penicillata. Capsula loculicide quinquevalvis, valvulis medio septiferis demum septicide fissis.—Savannahs, British Guiana; *Schomburgk, n.* 133. Piauhy; *Gardner, n.* 2488.

I have some West Indian specimens from Forsyth's herbarium, marked *M. hirsuta*, with the habit of that plant; but

with the flowers, stamens, and styles of *M. vestita*, of which it appears to be a variety.

TILIACEÆ.

674. Corchorus *argutus, Humb. et Kunth.—DC. Prodr. v.* i. *p.* 504.—Moist savannahs, British Guiana; *Schomburgk, n.* 675.

Gardner's n. 936, from Pernambuco, is *C. tortipes*, St Hil. My specimens of his n. 935, from Pernambuco, and n. 1475, from Ceara, both belonging to *Corchorus*, are too young to determine the species.

675. Triumfetta *eriocarpa, St Hil. Fl. Bras. Merid. v.* i. *p.* 288.—British Guiana; *Schomburgk, n.* 271. Rio Janeiro; *Gardner, n.* 14. Bahia; *Salzmann.*—The plant appears to be suffrutescent.

676. Luhea *rufescens, St Hil. Fl. Bras. Merid. v.* i. *p.* 293, *t.* 58.—Anna-y, British Guiana; *Schomburgk.*—This answers in every respect to St Hilaire's figure and description, except that the pedicels are not so long, and the fimbriate appendages of the staminal tube are rather shorter even than in the figure. These appendages are stated in the text to be an inch and a half long; but from the figure it is evident, that by a misprint, the word is *sesquipollicarem*, instead of *semipollicarem*. Martius's *L. grandiflora* has the foliage and habit of this species; but is at once known by the cordate leaflets of the external calyx.

Gardner's n. 1477, from Ceara, is *L. paniculata*, Mart.: and n. 2490, from Piauhy, is a species very closely allied to it, if not the same.

677. Mollia *speciosa, Mart. Nov. Gen. et Sp.*—British Guiana; *Schomburgk, n.* 566, in the later sets.

678. M. *glabrescens* (sp. n.); foliis ovali-ellipticis acuminatis leviter serrato-crenatis utrinque ramulisque glabris, ovario oblongo in stylum acuminato.—Arbor 40—50-pedalis. Folia minora tenuiora quam in *M. speciosa*, 3—4-pollicaria, basi rotundata, trinervia, reticulata, venosa, subtus in axillis venarum hinc inde barbellata. Pedicelli e tuberculo axillari

in ramulis superioribus orti, solitarii bini v. terni, pollicares, rigidi, superne incrassati et lepidoti.—Flores minores et tenuiores quam in *M. speciosa*, albi. Sepala 5, pollicaria, anguste linearia, acuta, extus lepidota, intus pilis adpressis cano-villosa. Petala 5, oblongo-linearia, sepalis æquilonga v. paullo longiora, 3 lin. lata, in unguem angustata, intus longitudinaliter pilosula. Staminum adelphia 5 exteriora sepalis opposita et iis æquilonga, breviter fissa, decanthera, 5 interiora dimidio fere breviora, ad medium fissa in filamenta 40—50 tenuia, pleraque antherifera, nonnulla tamen sterilia. Ovarium, uti fructus junior, sessile, compressum, lepidotum, apice angustatum nec ut in *M. speciosa* emargitum, biloculare, ovulis in quoque loculo plurimis biseriatim affixis.—*Waikai Arrai*, of the Carribbees.—On the Rio Quitaro; *Schomburgk*, *n.* 566, in the earlier sets.

679. Apeiba *Tibourbou*, *Aubl.*—*DC. Prodr. v.* i. *p.* 514.—In tufts of wood on dry savannahs, Piràra; *Schomburgk*, *n.* 734. French Guiana; *Herb. Par. n.* 93. Ceara; *Gardner*, *n.* 1476*, and in other Brazilian collections.

680. Sloanea *Massoni*, *Sw.*—*DC. Prodr. v.* i. *p.* 515.—British Guiana; *Schomburgk*, *n.* 1021.—The style is not quite entire, being very shortly quadrifid at the point, though not near so much so as in *Dasynema*. The ovules are numerous in each cell. These species, and the allied *Adenobasium obtusifolium*, figured by Moricand in his *Plantes Nouvelles d'Amérique*, tend to show that the latter genus and *Dasynema*, are scarcely distinct from *Sloanea*.

681. Dasynema (Adenobasium) *laurifolium* (sp. n.); foliis ovali-oblongis sublanceolatisve acuminatis coriaceis utrinque pedunculisque trichotomis glaberrimis, sepalis 4 rarius 5 ovatis obtusiusculis, fructu glabro setis destituto.—Arbor 50-pedalis. Folia alterna v. subopposita, 4—6-pollicaria, petiolo semipollicari basi et apice incrassato, venis parum prominentibus. Pedunculi semel bisve trichotomi, infra ramificationem petiolo æquilongi. Bracteæ minutæ. Sepala vix 2 lin. longa, alba. Stamina numerosissima, disco lato foveolato persistente imposita, sepalis breviora. Ovarium tenu-

Chrislya speciosa. Harv.

issime puberulum, 4-loculare, loculis 4-ovulatis. Styli 4, ultra medium connati, apice divergentes. Fructus carnosus, obovoideus, 4—5 lin. longus, obscure tetragonus, superficie in sicco canescente et nullo modo setoso, pericarpio crasso in valvulas 4 partibile, vix tamen ut videtur sponte dehiscit. Semen abortu unicum, pendulum.—On the Rio Negro; *Schomburgk, n.* 936.

Gardner's n. 327, from the Organ Mountains, has narrower leaves with more prominent veins, larger flowers, and a somewhat downy inflorescence. With the exception of the size of the flowers, it agrees with Presl's figure and description of his *Adenobasium salicifolium.*

(*To be continued.*)

VII.—*Description of* CHRISTYA, *a new genus of* APOCYNACEÆ *from the Cape of Good Hope; with Remarks on some other Cape plants of that order.* By the Honourable W. H. HARVEY.

(TAB. XXI.)

MR WARD and myself have long wished for the opportunity, which the discovery of the present plant affords us, of paying an affectionate tribute to the memory of our lamented friend, WILLIAM CHRISTY, Jun., Esq., F.L.S., whose private worth endeared him to a wide circle of friends, and whose ardent attachment to Botany, and patronage of Botanical travellers, entitle him to the respectful remembrance of Botanists. In selecting a plant to bear his name, we had two objects particularly in view: to choose one that might be a desirable addition to an English greenhouse, that thus the memory of our friend, (whose chief pleasure, during a lingering and painful illness, arose from horticultural pursuits,) might pleasingly awaken in the mind, fresh with the returning summer; and by selecting one whose curious distinctional characters might make it interesting to Botanists to weave a coronal fitting to the urn of the departed man of science. The plant, about to be described, possesses both these requisites in an eminent degree.

CHRISTYA. *Ward and Harvey.*

Calyx quinque partitus, lobis lanceolatis, basi intus glandula bifida auctis, persistens. *Corolla* hypogyna, tubo campanulato-infundibuliformi, calycem duplo superante; *faux* squamis bifidis, limbi laciniis alternis, carnosis, exsertis coronata; *limbus* quinquepartitus, laciniis lineari-attenuatis, elongatis, obtusis, canaliculatis, equilateris, æstivatione spiraliter tortis. *Stamina* 5, imo corollæ tubo inserta, inclusa; *filamenta* brevissima; *antheræ* sagittatæ, subulatæ, acutæ, dorso barbatæ, circa stigma cohærentes, eoque basi adnatæ. *Ovaria* 2; ovulis ad suturam plurimis. *Stylus* lineari-clavatus, elongatus, in discum dilatatus; *stigma* capitatum, velutino-pulvinatum. *Folliculi. . . . . ?*

Christya *speciosa. Ward and Harvey.*

HAB. Inter frutices prope "Kat-Riviere," C. B. S.—*D. Bartels.* (fide Cel. *Pappe* qui specimen humanissime communicavit.)—" Winterberg," C.B.S. (sine flore,) *Ecklon and Zeyher* (-fide Cel. *Pappe.*)

Frutex erectus, trichotome (?) ramosus. *Rami* virgati, teretes, apicem versus subquadranguli, minutissime pubescentes, demum glabrati. *Folia* opposita vel sæpius quaterna, obovato-lanceolata, subacuta, basi attenuata, erecto-patentia, glabra, petiolata; *petiolis* brevibus, basi intus squamulis binis carnosis instructis. *Paniculæ* terminales, vel pseudo-laterales, dichotomæ, cymosæ; pedunculis pubescentibus, pedicellis longiusculis, subclavatis, basi bracteolatis. *Flores* magni, speciosi, aurei (?). *Calyx* corollaque minutissime et mollissime pubescentes.

From this description it will be seen that *Christya* is in many respects allied to *Ectadium*, E. M., a plant also from the Cape, though coming from a very different part of South Africa, and differing in many important characters. *Ectadium* like *Christya*, is a shrub with rod-like branches, but its flowers are small, and floral characters very different. In *Ectadium* there are no fleshy scales without the corolla; but, on the contrary, a 5-crenate saucer-shaped, hypogynous disc,

composed of 5 connate scales; the corolla tube is narrow, and not longer than the calyx, and its lobes are not longer than the tube; the coronal squamæ are laterally compressed, included, projecting across the tube, and undivided; the anthers do not *cohere* by their edges, though they form a cone round the stigma; and, moreover, they are produced at the tips into long, bearded acuminations: the style is short, and the stigma, which Meyer calls peltate, I find to be capitate, 5-angled, with a bifid, subulate acumination.

The existence of fleshy scales within the calyx, though mentioned but in few genera of the order, seems to be of frequent occurrence; and perhaps these bodies are present in some form or other in all cases where there are no *hypogynous* discs or scales. I find them in the Cape *Arduinæ* in the form of a ring of unequal, subulate, fleshy bodies, encircling the base of the calyx, not " a many-toothed *hypogynous* disc," as incorrectly stated in my " genera," p. 231. In " *Voacanga Dregei*," E. M., I find the lower part of the tubular calyx muricated on the inside with several rows of fleshy scales. This plant does not appear to be a true species of *Voacanga*, but seems much more nearly allied to *Orchipeda* of Blume, if it be distinct from it; but as I am unacquainted with Blume's plant, and the description does not quite accord, I propose to call our African species *Piptolæna*, in allusion to the deciduous calyx.* In another new Cape genus, *Toxicophlæa*, founded on *Cestrum venenatum* of Thunberg, there is an obsolete crenate disc, exterior to the corolla, and covering the base of the calyx. In *Gonioma* there is a small fleshy hypogynous disc, but no calycine glands; and in *Pachypodium* (*Belonites*, E. M.,) though denied by Endlicher, and omitted by Meyer, there are five large, fleshy, distinct (in *P. succulentum*) or connate (in *P. bispinosum*) hypogynous scales; but none outside the corolla.

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* It is rather a curious circumstance, that though *three* species of *Cestrum* have been attributed to the Cape Flora, not one of them belongs either to *Cestrum*, or to the *Solanaceæ;* nor do any two of them belong to the same natural order. *C. venenatum*, Thunb., constitutes, as above noticed, a genus of *Apocyneæ* of the section *Carisseæ* with solitary ovules, by which and the other characters, it differs from all the other genera of that section. *C. dubium* of Sprengel, in Herb. Zeyher, which is the same as *Grumilia*, 2360, and of Drege's plants, is an *Ehretia* (E. capensis, H.); and lastly, but surely not *least* of these extravagant blunders, *C. umbellatum* of E. Meyer, in Herb. Drege, is *Peddiea Africana.* W. H. H.

In *Christya*, owing to the transparency of the parts, the style is very evidently seen to be composed of two styles, one issuing from each ovary, enclosed within a membranous sheath, whose apex expands in a disc-like body, beneath the common pulvinate stigma. This structure is probably that of the styles of other genera, at least of those with double ovaries and simple styles, to many of which, styles expanding at the apex into *discs* or *cups*, are attributed; and it seems analogous to the structure observed in *Goodeniaceæ*.

Dr Pappe informs me that *Trichocludus verticillatus* of Ecklon and Zeyher's catalogue, which they gathered without flower, is our *Christya speciosa*. I have seen no specimen of their plant, but the "*very long bipartite capsule*" mentioned in their description, whose contents I presume they omitted to examine, may have been the young *follicles* of our plant.

W. H. H.

TAB. XXI.—Christya speciosa. *Fig*. 1. *Calyx* laid open: *magnified*. *f*. 2. *Corolla* do.: *magnified*. *f*. 3. Anther. *f*. 4. Style and stigma. *f*. 5. Ovaries, as they lie. *f*. 6. Do. pulled asunder. *f*. 7. Ovary, cut open to show the placenta covered with ovules.

VIII.—*An account of the Tree which produces the* HOG-GUM *of Jamaica, read before the Jamaica Society for the encouragement of Agriculture and Horticulture, on the 18th February,* 1829. By Dr E. N. BANCROFT, *of Kingston, Jamaica.*

[THIS interesting communication, from our valued friend, Dr Bancroft, has been long in our possession, and the publication has been delayed from various causes. We omit the discussion relative to the genus of this plant, because it is quite clear that it is the *Monobea coccinea* of Aublet, which has been lately so admirably illustrated by Martius, in his *Nov. Gen. et Sp. Pl. Brasil*, or a very nearly allied species.—Ed.]

When doubts have long existed, or when error has been prevalent, on any subject connected with science, to clear up those doubts, or to point out and remove the error, is to render a service to the advancement of knowledge, which may sometimes be scarcely inferior to the discovery of a new truth; and it is under this persuasion that I gladly avail myself of the opportunities and means that have been placed within my reach, chiefly through the kindness of Mr Thomas Higson, a member of this Society, in order to make known a tree, which belongs to a curious natural order, the *Guttiferæ*, that is acknowledged by all botanists to require elucidation more than almost any other order, and which is the more interesting as being the tree from which is really derived the Gum-Resin that, under the name of *Hog-Gum*, has for a great length of time been highly praised, particularly by Sir Hans Sloane, Drs Browne and Barham, Mr Long and others, for the medicinal virtues which they supposed it to possess, and concerning the origin of which there has hitherto been great confusion and error.

That Sir Hans Sloane was entirely misled on the subject is clear from his account of the tree which he believed to yield the gum in question, and which therefore (at page 167 of his catalogue of the plants of Jamaica, published in 1696, and again at page 90 of the 2d volume of his Natural History of Jamaica, published in 1725,) he called "the Hog-doctor-tree, or Boar-tree," and described as a "Terebinthus maxima, pinnis paucioribus majoribus, atque rotundioribus, fructu racemoso sparso," &c. He has also given a figure of it in his 199th plate; but both description and figure differ materially from the true Hog-Gum tree. Dr Patrick Brown nevertheless appears to have relied so entirely upon the correctness of Sir Hans Sloane's information, as to have thought that nothing more was required than to ascertain with greater accuracy the botanical characters of his tree, and he accordingly gave a description of these, and assigned them to a new genus, ***Metopium*** (***Rhus Metopium*** of Linnæus,) at page 177 of his Civil and Natural History of Jamaica, first published in 1756, and a figure also in his 13th plate. Upon the faith of these authorities, another historian of this island, Mr Long, at page 723, volume iii. of his History of Jamaica, 1774, and indeed almost every other person, including the celebrated M. De Candolle, (page 67, vol. ii. of his *Prodromus Systematis Naturalis Regni Vegetabilis*,) has since been led to consider the ***Rhus Metopium*** as the Jamaica Hog-Gum tree; and the error would very probably have continued much longer if a botanist of great merit, Dr Bertero of Piedmont, who visited this island for a short time in 1821, had not had his curiosity accidentally excited to ascertain which was really the tree. He happened to speak of the Hog-gum in the presence of Mr Higson, who then said that he lately had occasion to make the search, and had discovered that the ***Rhus Metopium*** of Brown, was not the tree which produced it, and, on finding Dr Bertero perfectly incredulous, he offered to show him the tree in its native mountains. The offer was accepted, Mr Higson's assertion verified, and a botanical description of the tree, and of its flowers, was drawn up in Latin by Dr Bertero, of which he gave a copy to Mr Higson; but the season being yet too early, no fruit was found, and the description was necessarily incomplete in that important respect. Mr Higson's affairs having afterwards called him into New Grenada, he was shipwrecked in the bay of Buenaventura, and, among various papers damaged by the salt-water, was the description just mentioned, many portions of which are entirely obliterated. Since Mr Higson's return, he has watched the fructification of the Hog-Gum tree, and has occasionally favoured me with fresh specimens of its flowers, ripe fruit, &c.; and from these, as well as from the remains of Dr Bertero's paper, which is now before me, I shall presently detail its botanical characters.

I may previously mention, however, that I am enabled also to clear up the obscurity which has long prevailed in regard to the tree called *Bois à Cochon* by the French in St Domingo. Two former medical practitioners of that island, Mons. Corbérand and Mons. Daron, and some others of its ancient inhabitants, since settled in Jamaica, having procured me specimens of the tree long known there to themselves under the above name, and of its gum, I compared these with specimens from our Hog-Gum tree, and have ascertained their identity with each other. It is, nevertheless, somewhat singular, that, although the gum in question was not less prized in that colony than in this, as a remedy, equal uncertainty and confusion should have existed there, as here, concerning the plant from which it was obtained.

The first author of that island by whom I find it noticed, is M. Pouppé-Desportes. He mentions it at pages 32 and 285, of his *Traité des plantes usuelles de St Domingue*, published at Paris in 1770, under the names of *Sucrier de Montagne, ou Bois à Cochon*, not suspecting that the latter name properly belonged to a plant of a very different family and natural order from the former, while the description he has there given is applicable solely to the *Sucrier de Montagne*, which was so called, because its wood was preferred to all others for making staves for sugar hogsheads. Six years afterwards Père Nicolson, of the order of Dominicans, who had resided four years in St Domingo, published at Paris an *Essai sur l' Histoire Naturelle de St Domingue;* at page 169 of which he repeats the error of the preceding writer, in mentioning *Bois à Cochon* as synonymous with *Sucrier de Montagne*, and gives a brief account of the tree, which coincides entirely with that of M. Desportes, and seems indeed to have been partly taken from it, although without any acknowledgment. A few years after this, an eminent botanist, Mr Olof Swartz, visited St Domingo, who, giving entire credit, as it appears, to the account of Père Nicolson, to which alone he has referred, restricted his inquiries to the simple determination of the botanical characters of the tree properly called *Sucrier de Montagne*, and upon finding them to be peculiar, and as yet unknown, he created for them a new genus, and named the tree *Hedwigia balsamifera*, at page 62 of his *Nova Genera et Species Plantarum*, published in 1788, and at page 670 of his *Flora Indica Occidentalis*; but in quoting the work of Père Nicolson, he noticed only one of his synonyms, and that the wrong one, *i. e. Bois à Cochon*, and has thereby given a degree of weight and a currency to the previous error, which the slender pretensions to botanical science of the works of M. Desportes and Père Nicolson would never have conferred on it, and induced other botanists to adopt and disseminate that error. Of this M. De Candolle is again unfortunately an example, as he states, at page 80, vol. ii. of his Prodromus, *Hedwigia balsamifera* to be the *Bois à Cochon* of Père Nicolson, omitting altogether his other synonym *Sucrier de Montagne.* Recently Mons. Descourtilz, " ancien Médecin du gouvernement" in St Domingo, not aware of the mistakes above mentioned, has described and figured the *Hedwigia balsamifera* at page 263, vol. iii. of his *Flore Médicale des Antilles*, 1827, as being the *Sucrier de Montagne*, or *Bois à Cochon*, while Mons. Palisot-Beauvois, who had seen the tree in that island, has referred it to *Icica heptaphylla* of Aublet, *Plantes de la Guiane Française*, 1775, page 337, vol. i. That such a series of errors concerning one and the same tree should have been committed both here and in St Domingo, by individuals certainly possessed of superior attainments, may appear very strange; yet the occurrence, as I conceive, admits of easy explanation. As the *Hog-Gum* was always in demand, the Maroon Negroes,* by whom alone it was collected, made a mystery of it, that they might keep the monopoly to themselves, and purposely deceived those who asked for information, by pointing out to them some other than the real tree.

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* On mentioning very lately my belief of the deception practised by the Maroons as to the *Hog-Gum* tree to Dr Arnold, now of this city (1837) he confirmed it by saying, that he had resided several years at Port Antonio, around which the gum is found in great abundance, and had repeatedly endeavoured by promises and otherwise, to prevail on Maroons to show him the tree, but had always been misled by them, so that up to that time he had never seen it.

Here I beg leave to add, that the *Hog-Gum* tree appears to be likewise identical with the Indian *Mawna* tree, mentioned at page 74 of my father's Essay on the *Natural History of Guiana*, published in 1769, as growing to the height of fifty feet, producing "numerous pentapetalous flowers, succeeded by nuts resembling nutmegs, and yielding on incision a yellowish gum;" and it is very likely that the *Mawna* is the same with the tree and gum called *Mani* in Spanish America. I now proceed to describe the plant:—

The *Hog-Gum* tree is chiefly found in dense woods on the main, and the secondary ridges of the eastern parts of this island, at an elevation of from five hundred to five thousand feet above the level of the sea, where it grows in abundance, and presents an appearance both elegant and majestic. It is very branchy and leafy; the stem however is rather slender;* but, besides its tap root, it receives great support from the disposition of its lateral roots, which are numerous and thick, and issuing from the trunk at the distance of from one to six feet above the ground, bent downwards like arched props to spread themselves somewhat horizontally in the soil, a mode of rooting which is frequent in the nearly allied tribe of the *Clusieæ*.

The bark is of a rusty-brown colour, passing occasionally into a yellowish or into a greyish hue, moderately rough, from three to six lines in thickness, of a pale-fawn colour inside, and generally much covered with lichens. The wood, when first cut into, is whitish, but afterwards of a light-brown colour, rather soft, with fibres longitudinally parallel; it is used for shingles for inside work, and as fire-wood, but it does not endure exposure to the weather.

Branches opposite, more rarely alternate, spreading, some-

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* Some of the trees were cut down and measured by Mr Higson.

The stem of one,	49	feet in length,	measured	2½	feet in	circumference.
That of another,	55	do.	do.	3	do.	do.
And that of a third,	85	do.	do.	6	do.	do.

what horizontal, round, subdividing, cicatrized, of an ashy-brown colour, but green and shining at the extremities.

Leaves numerous on the younger branches, petioled, opposite, disposed in two rows, and appearing as if abruptly pinnated, oblong acuminate, three to four inches in length, by an inch to an inch and a half in breadth, smooth on each side, subcoriaceous, very entire, shining and deep-green on the upper surface, paler and veined on the under, impunctate. The veins are numerous, almost parallel, opaque, arising from the middle rib at nearly a right angle, and usually dividing close to the margin of the leaf.

Petioles nearly round, smooth, even, about a quarter of an inch long, channelled and flattened above the middle, jointed at base, deciduous, green.

Stipules two on each side of the petiole, acuminated, scarcely visible to the naked eye, and soon falling off without leaving any scar: whence the petioles might easily be thought to be exstipulate, as they are stated to be generally in the order *Guttiferæ.*

Buds terminal and axillary, subcylindrical, smooth, acuminated, covered by four acuminated, keeled, equitant, caducous, green scales.

The flowers bear their organs in a quinary proportion, in which respect they again differ from the majority of the *Guttiferæ;* they are hermaphrodite, pedunculated, terminal at the tips of the branchlets, in racemes of from four to twelve flowers, more rarely single or in pairs, or in threes, in the axils of the leaves, appearing about the same time with the leaves, inodorous. The flowers never expand fully, but continue with the petals closely overlapping each other, except at top, where they dilate slightly, and by a notch at their tips form a small opening, through which the ends of the connivent fasciculi of stamens gradually issue in the form of a short cone.

Peduncles round, slighty club-shaped, one-flowered, smooth, even, gently curved, green, often reddish above, jointed at base, and there furnished with minute bracteæ, which fall off readily, leaving semilunar scars on the flower-bearing tubercles of the twigs.

Calyx inferior, somewhat bell-shaped, smooth, even, persistent, of a greenish colour often passing into red; sepals five, entire, equal, rounded, nerveless, veinless, thickened and united at base, and quincuncially disposed, *i. e.* two sepals being exterior, and two interior, while one side of the fifth partially covers an interior one, and its other side is covered by one of the exteriors.

Corolla five-petaled, many times larger than the calyx, obovate in the bud, globular and not exceeding half-an inch in diameter when expanded; petals hypogynous, subcoriaceous, equal, concave, free, subemarginate, smooth, shining, of a bright crimson colour, but paler on the inside; æstivation contorted, each petal occupying three-fifths of the circumference of the corolla, and having two-thirds of its breadth covered by the next one.

Stamens a little longer than the corolla, and issuing above it as a short cone, hypogynous; filaments united at their lower half into a tube surrounding the ovary; tube fleshy, smooth, shining, at first white, afterwards crimson, closely embraced at base by an annular disk, and divided from the middle upwards into five equal, fleshy, lanceolate, connivent rose-coloured fasciculi or adelphiæ, that entirely cover the style, and also the stigmas, with the exception of their tips; each fasciculus being furnished with a keel on the inside, which serves to connect three filaments into one adelphia, but incised on the outside with two deep grooves, that extend from the base of the anthers to its apex, and separate its external portion into three subdivisions, *i. e.*[*] filaments, and bearing on the lower part of its back (immediately above the division of the tube into fasciculi,) three anthers, rarely two, sessile each on its corresponding filament. The anthers are half the length of the fasciculi, and have likewise a keel along the middle of their inner surface, which is inserted into a corresponding groove on the back of the filaments just mentioned, the edges of the anthers being free; and besides this, the anthers have another peculiarity of structure which I have not observed in other plants, nor found described by authors. They are didymous, and, when young, each part appears to be grooved longitudinally, and to consist of two linear lobes, that are likewise grooved along the middle, and pointed at each end; but when the anther is fully developed, the point and the groove disappear from the upper end, and the two sides become there united into a rounded apex, so as to resemble a flexible cylinder, bent in the middle, with the halves reflected perpendicularly downwards and coherent, but retaining their pointed extremities at base. In other respects the anthers are linear, parallel, nearly equal, smooth, shining, yellow, the lobes dehiscing along the middle groove. Pollen ovoid, yellow.

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[*] When the stamineous tube is held to the light and examined with a lens, fibres are seen to descend within it, each corresponding with one of the upper divisions or filaments of the fasciculi.

The ovary is superior, pedicelled, egg-shaped, smooth, shining, and on careful dissection, was found to be five-celled, each cell containing two kidney-shaped ovules, attached about the middle of a central columnar placenta. Pedicel of the ovary short, thick, and studded, with five flattened greenish glands. Style short, thick, subconical, crimson, permanent, dividing above into five oblong, fleshy, radiate, subsigmoid stigmas, acute at the tip and rose-coloured, the points of which issue from between the stamineous fasciculi, a little above the anthers; stigmas also permanent.

Disk, or nectary, somewhat fleshy, short, cup-like, smooth, persistent, encircling as a ring the base of the stamineous tube, five-angled at base, obsoletely five-toothed at the border, green, yielding a simply sweet juice, permanent.

Fruit, a subcoriacent succulent indehiscent pericarp, about the size of a small pigeon's egg, egg-shaped, slightly compressed, gibbous on one side, subscabrous, of a green colour tinged on the gibbous side with reddish brown, crowned with the prominent style and stigmas, and, by abortion, one-celled, one-seeded; the pulp about the eighth of an inch in thickness, of a pleasant, sweet and subacid taste, and abounding with a thick yellow juice. It generally ripens in August.

The seed is about an inch in length, nearly egg-shaped, flattened on the side towards the placenta, irregularly furrowed on its surface, of a brown colour, completely enclosed within an arillus, and covered by a very thin coat which appears to consist of a single membrane. It is exalbuminous; the embryo subconical, nearly as long as, and occupying the middle of the seed, straight, having its ends slightly curved, the upper from the placenta, and the lower towards it; cotyledons thick and united, forming one mass, as in monocotyledons. Concerning the radicle and the plumula I can furnish no particulars, as none of the seeds sown by me germinated. The arillus is of a very delicate structure, smooth, and of a light brown colour outwardly, and nearly transparent when separated from the seed. Upon it numerous vessels are seen to ramify from a main trunk, which arises at the umbilicus on the middle of the side next to the placenta, and proceeds in nearly a direct line to the further end, a little beyond which it divides into several branches that send off branchlets, anastomosing and spreading over the whole membrane, the larger ones causing by their pressure corresponding furrows over the surface of the seed, similar to those on the nutmeg. In the fresh unripe fruit, these vessels contain a light crimson fluid, giving to the arillus a resemblance to the pia mater of the brain. The inner surface of that membrane is covered with a very fine silky down, of a brownish fawn colour, the fibrils of which, examined by a lens, seemed to enter into the spermo-dermis. By its arillated seeds, with consolidated cotyledons, this plant has an affinity to *Garcinia* of Linné and *Ochrocarpus* of Petit-Thouars: but in the former, the vessels of the arillus appear to ramify immediately from the umbilicus as from a centre. See *Gærtner de Fructibus, Tab.* CV. *fig. d.*

Every part of the plant, from the bark even to the petals and anthers, when cut or bruised, gives out freely a thick juice of a bright sulphur yellow, that is very viscid, has a faint smell, and gradually hardens into a mass of the nature of Gum-Resin, at first of a light yellow, but in time becoming brown, that is very inflammable, and burns with a smoke yielding an aromatic and rather agreeable odour, and is well known in this island by the name of *Hog-Gum.* It is chiefly collected for sale by the Maroon Negroes, who, when they meet with old and decayed *Hog-Gum* trees, dig about the main roots projecting from the stem, where they seldom fail to find it in masses that sometimes measure eight or nine inches in diameter. To obtain the gum by incisions from living trees would cost them too much time and trouble.

From the description which has been given of the plant, its distinctive botanical characters appear to be the following:—Sepals five, æstivation quincuncial. Petals five, subcoriaceous, æstivation contorted. Stamens fifteen, encircled at base by a disk, united at their lower half into a tube, divided above into five fasciculi, bearing each three anthers towards its base; style one, stigmas five, radiate ovary five-celled, cells two seeded; fruit a succulent subcoriaceous pericarp crowned with the salient style and stigmas, and by abortion one-celled, one-seeded; seed arillated, and pseudo-monocotyledonous.

Before I conclude, an apology may be proper on my part for giving publicity to this account of the *Hog-Gum* tree, when I have stated that Dr Bertero had written a partial description of it while here in 1821. In the same year he returned to Europe, where it appears from De Candolle's Prodromus, that he communicated to botanists, and more particularly to that author and to Professor Balbis, information and specimens of various plants he had discovered in the West Indies, two of which belong to the same natural order with our plant, viz. *Mahurea speciosa*, and *Clusia acuminata*, the latter being given upon Dr Bertero's sole authority; and yet his name is not quoted concerning any of the other plants included among the *Guttiferæ*, whence it seems to be a natural conclusion, that he may have thought the notes he had taken of the *Hog-Gum* tree insufficient for publication. It was with this impression that, at the request of Mr Higson and other members, I drew up the present account, (with the exception of the last two or three pages,) and read it before the Jamaica Society in 1829; but it was not then printed, and I had no wish to anticipate or to compete with a botanist, whose scientific attainments, and personal qualities I appreciated highly. Afterwards, however, I learnt with extreme regret, that he had embarked at Havre for Chili in 1828, with the intention of exploring the vegetable productions of that part of the world, and that he had there lost his life; and this intelligence I do not find to have ever been contradicted during the seven or eight years that have since elapsed. If therefore, under these circumstances, I now at length submit to the public the information which I have been able to collect concerning a plant that cannot but interest the curiosity of botanists, I trust that, instead of seeking to diminish or suppress the merits of Dr Bertero, in regard to this plant, I shall rather be considered as fulfilling the strong desire which he once felt, that the characters of the true *Hog-Gum* tree should be fully made known.

E. N. BANCROFT.

KINGSTON, JAMAICA,
10*th June*, 1837.

IX.—*An arrangement and definition of the* GENERA OF FERNS, *with observations on the affinities of each Genus.* By J. SMITH, A. L. S.

(*Continued from page* 70, *of the present Volume.*)

TRIBE II. ACROSTICHIEÆ.

SORI not of any defined form, (amorphous,) destitute of a special indusium, the sporangia closely occupying the whole or a portion of the under side (or rarely both sides) of the fertile frond, which are always more or less contracted, forming an universal sporangiferous receptacle; the margin often membraneous and indusiiform.

Obs. This tribe is entirely composed of species which formed the extensive genus *Acrostichum*, as characterized by Swartz, Willdenow, and others; and contains above 100 described species. It is readily known from *Polypodieæ* by the sporangia not being produced in defined, round, or linear masses, but closely occupying the whole, or some portion of the fertile disk, which in the genus *Olfersia*, and some species of *Polybotrya*, is not confined to the inferior disk alone, the contracted rachiform segments being sporangiferous on all sides. The contracted state of the fertile frond does not admit the venation to be clearly seen, but in the genus *Cyrtogonium* it is in general very evident, and forms the principal receptacle of the sporangia as in *Polypodieæ*. The chief characters upon which the following genera are founded are derived from the various modifications of the veins of the sterile fronds, which exhibit structure analogous to the several sections of the preceding tribe; therefore the amorphous sori must be viewed as the only distinction between them, and even that is not always to be depended on, as it has been shown that *Stenosemia*, in some states, assumes the character of *Acrostichieæ*.

SECT. I. ORTHOPHLEBIEÆ.

Veins simple, forked, or costæform and pinnate; *venules* direct, their apices free.

38. ELAPHOGLOSSUM, *Schott.*

(Acrostichi, *sp. Auth.* Olfersiæ, *sp. Presl.*)

Veins simple, or forked, internal; *venules* parallel, their apices free and clavate, terminating within a thickened margin.

Fronds *simple, entire, oblong, or linear-lanceolate, smooth, or squamose; margin of the fertile fronds usually membraneous.*

Examp. 1. E. simplex, (*Sw.*) 2. E. apodum, (*Kaulf.*) 3. E. viscosum, (*Sw.*) 4. E. conforme, (*Sw.*) 5. E. squamosum, (*Sw.*) 6. E. villosum, (*Sw.*) *Illust. Hook. et Grev. Ic. Fil. t.* 2, 4, 21, 22, 99.

39. STENOCHLÆNA, *J. Sm.*

(Acrostichi, *sp. Auth.* Lomariæ, *sp. Kaulf. Wall. Willd.* Olfersiæ, *sp. Presl.*)

Veins simple or forked, external; *venules* parallel, their apices exserted, forming cartilaginous serratures, or conniving and forming a thickened margin; margin of the fertile segments membraneous, revolute, indusiiform.

Fronds *pinnate, smooth, or squamose, pinnæ petiolated, articulated with the rachis.* Fertile pinnæ *linear revolute.* Rachis *sometimes producing abnormal tripinnatifid sterile fronds.*

Examp. 1. S. longifolia, (Lomaria, *Kaulf.*) 2. S. sorbifolia, (*Linn.*) (Lomaria, *Kaulf.*) 3. S. scandens, (*Linn.*) 4. S. triquetra, (*Wall.*) 5. S. spondicifolia, (*Lomaria, Wall.*) 6. S. limonifolia, (Lomaria, *Wall.*) 7. S. heteromorpha, *J. Sm.* (*Lomaria, filiformis, A. Cunn. Lomaria propinqua, A. Cunn.*) Illust. *Schk. crypt. t.* 106, 107.

Obs. The distinct and peculiar aspect of the species forming this genus evidently denotes them as forming a distinct and very natural group, yet on setting their habit aside, it becomes difficult to point out a good technical character to distinguish them from the preceding genus, as also from the following. Their habit and the indusiiform margin of the fertile pinnæ agree in many respects with *Lomaria*, a genus in the following tribe, which differs from the present genus, by its having a special indusium not formed of the revolute margin, as in *Stenochlæna*, but rising from a receptacle a little within the margin. Some of the species of this genus are remarkable for producing a third form of frond, so unlike the usual forms, that, in the absence of good authority, it would be difficult to believe that it formed part of the same plant. The rhizoma is creeping, and ascends sometimes to a considerable height on trees, and producing at the apex the usual form of fertile and sterile pinnate fronds, which are sometimes two to three feet in length, while the abnormal fronds are usually about three inches in length, tripinnatifid, and barren; not unlike some multifid species of

Davallia, or *Cheilanthes*, they are produced on lengthened rachis-like parts of the rhizoma, which are smooth or aculeate; it is difficult to say under what circumstances or modifications of structure this singular growth is produced, but probably I am not far wrong in stating that it may be considered as analogous to the *Trichomanoid* growth, found on the stipes of *Hemitelia capensis*.

40. POLYBOTRYA, *Humb. Kaulf.*

(Acrostichi, *Sp. Sw. Hook.* Rhipidopteris, *Schott.* Egenolfia, *Schott.*)

Veins radiating and forked, or costæform and pinnate, external; *venules* simple, free; *sporangia* occupying one or both sides of the spiciform segments.

Fronds *pinnate, bi-* or *tripinnate, rarely digitate and laciniated.* Sterile pinnules *crenate or pinnatifid.* Fertile *linear or racemose, bearing the sporangia on one, or generally on both sides, or in distinct irregular masses.*

* RHIPIDOPTERIS, *Schott.*

Fronds flabellate, digitate-multipartite, or entire.

Examp. 1. P. peltata, (*Sw.*) 2. P. tripartita, (*Hook.*) 3. P. fœniculaceum, (*Hook.*) 4. P. bifurcata, (*Sw.*)

** POLYBOTRYA VERA.

Fronds pinnate, or bi-tripinnate.

5. P. vivipara, (*Hook.*) 6. P. appendiculata, (*Willd.*) 7. P. cylindrica, *Kaulf.* 8. P. speciosa, *Schott.* 9. P. acuminata, *Kaulf.* 10. P. incisa, *Link.* 11. P. osmundacea, *Humb.* *Illust. Schott. Gen. Fil. t.* 7, 16. *Hook. Gen. Fil. t.* 78. *b.*

Obs. Although this genus is distinct in habit from the two preceding genera, yet it is very difficult to characterize them as distinct by their venation: this is especially the case with those species of *Polybotrya*, which have their fertile segments not so much contracted as in others, and bearing the sporangia only on the under side; the most obvious difference is in the veins of *Elaphoglossum*, being generally internal, and in their having a distinct thickened apex, terminating within a thickened margin. From *Stenochlæna*, the most obvious distinction is the petioles not being articulated with the rachis; but that is not always general; for in a species from Luzon, which I have placed under *Polybotrya*, the pinnules are truly articulated with the rachis, but in other respects this species partakes more of the habit of *Polybotrya* than of *Stenochlæna.*

SECT. II. SYMPLOPHLEBIEÆ.

Veins direct, their apices combined by a transverse marginal straight or angular vein; or uniform and reticulated; or costæform and pinnate, the venules simply or compoundly anastomosing.

41. ACONIOPTERIS, *Presl.*

Acrostichi, *Sp. Hook. et Grev.*

Veins simple or forked, elevated, parallel, their apices bifid, and angularly anastomosing, forming a continuous zig-zag marginal vein, and producing a short excurrent veinlet from the angular junctions, which terminate within the margin.

Fronds *simple, linear-lanceolate, squamose;* sterile *slightly plicate and marginate; margin of the fertile membraneous, indusiiform.*

Species. 1. A. subdiaphanum, *Presl.* (Acrostichum, *Hook. et Grev.*) *Illust. Hook. et Grev. Ic. Fil. t.* 205. *Hook. Gen. Fil. t.* 79. *b.*

Obs. This genus is formed upon a single species which, in habit, is similar to *Elaphoglossum*, but differing in the veins, being prominently elevated, and angularly combined at the margin. The same characters distinguish it from *Olfersia*, which differ also in having sporangia on both sides of the segments.

42. OLFERSIA, *Radd.*

Veins forked, internal, parallel, their apices combined by a transverse, continuous marginal straight vein; fertile segments sporangiferous on both sides!

Fronds *pinnate, smooth*; fertile pinnæ, *linear, entire, or pinnatifid, smooth.*

Species. 1. O. corcovadensis, *Radd.* 2. O. cervina, *Presl.* (Polybotrya, *Kaulf.*) *Illust. Schott. Gen. Fil. t.* 6. *Hook. et Grev. Ic. Fil. t.* 81.

Obs. Agrees with *Polybotrya* in the character of its fertile fronds, but differing in habit, and also in venation; the marginal vein or border readily distinguishes it from *Elaphoglossum,* with which it has some affinity in the sterile pinnæ, being analogous in form and texture to the simple fronds of *Elaphoglossum.*

43. ACROSTICHUM, *Linn. J. Sm.*

Venation uniform, reticulated, forming elongated areoles; *sporangia* universal on the under side.

Fronds *simple, entire, or pinnate, smooth, coriaceous, rarely membraneous or squamose; the whole or the upper part only of the fertile frond sporangiferous.*

Examp. 1. A. citrifolium, *Linn.* 2. A. crinitum, *Sw.* 3. A. reticulatum, *Kaulf.* 4. A. obliquum, *Blume.* 5. A. aureum, *Linn. Illust. Hook. et Grev. Ic. Fil. t.* 1. Blume, *Fl. Jav. t.* 9, 16, 17.

Obs. Acrostichum citrifolium of Linn. agrees in habit and venation with *Antrophyum,* but differs from that genus, as also from the other species of *Acrostichum,* by the sporangia being irregularly and sparingly disposed over the under side of the frond, generally in small groups, without regard to the veins; but although peculiar in that respect, still I cannot at present find sufficient character to induce me to place it otherwise than in the present genus.

44. LOMAGRAMMA, *J. Sm.*

Venation uniform, reticulated, forming nearly equal hexagonal areoles. Sporangiferous receptacle amorphous, constituting an elongated continuous broad marginal sorus.

Fronds 2 *to* 3 *feet high, pinnate;* pinnæ *linear, lanceolate, four to six inches long, sessile and articulated with the ra-*

chis; fertile *contracted, bearing the sporangia in the form of a broad transverse sorus.*

Species. L. pteroides, *J. Sm.*

Illust. Hook. Gen. Fil. ined.

Obs. This genus is founded upon a solitary species from the island of Luzon, which in habit has some affinity with *Stenochlæna,* but it is distinguished from that genus by its reticulated venation, which is similar to that of *Acrostichum,* especially to one or two of the simple-fronded species; but from which it differs not only in habit and in the articulated petioles, but also in the sporangia, occupying only the marginal portion of the disk of the pinnæ, therefore in that respect having some similarity to *Lomaria,* and in its reticulated veins to *Litobrochia,* but these two genera are characterized with a special exteriorly attached indusium, and consequently not belonging to this tribe. Probably this fern may be the *Leptochilus lomarioides* of Blume, but his description is too brief to enable me to determine with certainty.

45. Platycerium, *Desv.*

Veins repeatedly forked, and distantly anostomosing; *venules* internal, compoundly reticulated, with variously directed free veinlets, terminating in the areoles, sporangiferous receptacle formed of an accessary layer of parallel anastomosing veinlets which cross the sterile ones, producing crowded linear lines of sporangia, and densely furnished with stellated scales.

Fronds *thick and spongy.* Sterile *sessile, rounded, or elongated, depressed, or ascending, permanent and successively imbricated, forming an elevated spongy mass.* Fertile *widening upwards, and dividing into broad forked segments, producing the sporangia towards the extremities, or on a special lateral thickened lobe; the whole (especially when young,) densely covered with stellated scales.*

Species. 1. P. alcicane, *Desv.* 2. P. stemaria, *Desv.* 3. P. biforme, *Blume.* 4. P. grande, *A. Cunn.*

Illust. Blume, Fl. Jav. t. 18. *Hook. Gen. Fil. t.* 80. B.

Obs. The whole habit and character of the species forming this genus is very peculiar, and totally distinct from any other genus of ferns, but agreeing in the amorphous production of the sporangia with *Acrostichieæ*. Besides being distinct in habit, the sporangiferous receptacle also presents a structure peculiar to this genus, being formed of an accessary layer of minute veinlets which appear independent of the general vascular structure.

The thick coriaceous texture, and the stellated pubescence, show some analogy to *Niphobolus*, but otherwise that genus is very different.

46. CYRTOGONIUM, *J. Sm.*

(Acrostichiæ, *sp. Auth.* Poecilopteris, *Presl.* Campium, *Presl.* Bolbitis, *Schott.* Jenkinsia, *Hook.*)

Veins costæform, pinnate; *venules* arcuately or angularly anostomosing, producing on their exterior sides or angles of meeting one or more excurrent free, or irregularly anostomosing veinlets; *sporangia* sometimes evident on the venules.

Fronds *pinnate, membraneous, smooth; pinnæ dentate or sinuous, often viviparous, margin of the fertile pinnæ usually membraneous and revolute, (indusiiform.)*

Examp. 1. C. crispatulum, (*Wall.*) 2. C. repandum, (*Blume.*) 3. C. costatum, (*Wall.*) 4. C. subcrenatum, (*Hook. et Grev.*) 5. C. virens, (*Wall.*) 6. C. diversifolium, (*Blume.*) 7. C. flagelliferum, (*Wall.*) 8. C. serratifolium, (*Kaulf.*) 9. C. scandens, (*Radd.*) 10. C. punctulatum, (*Linn.*)

Illust. Schott. Gen. Fil. t. 12. *Hook. et Grev. Ic. Fil. t.* 110, 221. *Hook. Gen. Fil. t.* 80. A.

Obs. Notwithstanding the different form of venation exhibited by several of the above species, yet, on taking their habit into consideration, and that the difference in the venation is no more than what we have already seen in species of other natural genera, I am induced to retain them under one genus, although Presl and others have characterized more or less of the species under several different genera. Cyrtogonium may be viewed as analogous in habit and venation to *Goniopteris*, *Meniscium*, and *Cyrptophlebium*, and the circumstance of the sporangia in some of the species being evidently produced on the venules, and only sparingly between them, tends still more to prove the affinity of this genus with *Meniscium.*

47. PHOTINOPTERIS, *J. Sm.*

Veins costæform, combined by transverse venules, forming quadrangular areoles, and including compound anastomosing, and variously directed free veinlets, which have clavate apices.

Fronds *coriaceous, smooth, pinnate, from two to three feet high, the upper part contracted and fertile.* Pinnæ *articulated with the rachis.* Petiole *short, dilated, its base vertically oblong, and furnished with an obtuse lobule on the lower side.* Sterile pinnæ *elliptical, lanceolate, and falcately attenuated at the apex, the base slightly oblique, from six to eight inches long by three inches wide, margin entire, thickened and slightly revolute.* Fertile pinnæ *linear, from eight inches to one foot in length, the underside wholly sporangiferous.*

Species. 1. P. simplex, *J. Sm.* 2. P. Horsfieldii, *J. Sm.* (Acrostichum ? rigidum, *Wall.*)

Illust. Hook. Gen. Fil. t. ined.

Obs. My attention was first called to this remarkable fern by the examination of a specimen in the herbarium of Dr Horsfield at the East India House, which was collected by that gentleman in Java, and it appears by a specimen in the *Wallichian Herbarium*, to have been also found near Singapore by Dr Wallich, in 1822 ; fine specimens from the island of Luzon, have now enabled me to form the above character, which must be confessed is scarcely distinct from the following genus, but the peculiar habit of *Photinopteris* totally prohibits its being associated with *Gymnopteris*, from which it is readily distinguished by the very obvious character of the articulation of the pinnæ with the rachis ; being analogous in that respect, as also in venation and aspect, to that section of *Drynaria*, of which *D. quercifolia*, and *D. diversifolia* are examples, and also with the genus *Dryostachium*, which approaches the present genus in its somewhat amorphous-looking sori.

It is highly probable that there is only one species of the genus, and that *P. simplex* is only an imperfect or starved form of the originally observed species. The smooth, shining aspect of the sterile pinnæ of this fern may without examination upon first sight be taken for the leaves of some exogen.

48. GYMNOPTERIS, *Bernh. Presl.*

(Acrostichii sp. *Auth.* Leptochilus, *Kaulf.* Hymenolepis, *Kaulf.*)

Veins uniform or costæform. *Venules* compoundly anastomosing and producing variously directed straight or curved free veinlets.

Fronds *simple entire, or pinnate.* Pinnæ *entire or sinuous, generally membraneous, and adherent to the rachis.* Sporangia *universal on the under side.* Fertile frond *sometimes spiciform with revolute conniving indusiiform margins.*

Examp. 1. G. spicata (Acrostichum, *Linn.* Hymenolepis ophioglossoides, *Kaulf.*) 2. G. axillaris (Leptochilis, *Kaulf.*) 3. G. platyrynchos; *J. Sm.* 4. G. quercifolia, *Bernh.* 5. G. nicotianifolia; (*Sw.*) 6. G. aliena; (*Sw.*) 7. G. acuminata; (*Willd.*)

Illust. Hook. gen. fil. t. 85.

Obs. The habit of this genus is somewhat similar to *Cyrtogonium*, but differing in the more irregular and compound anastomosing of the venules, and which is analogous to the *Phyllitidæ* section of *Drynaria*, with which the present genus also agrees in habit.

Tribe III. PTERIDEÆ, *J. Sm.*

Sori round, or elongated, and transverse, marginal, intramarginal or costal, simple, or by confluence compound, furnished with a special lateral indusium, which is produced on the exterior side of the sporangiferous receptacle, its inner margin free.

Obs. This tribe is represented by the extensive genera *Pteris*, *Adiantum*, and *Blachnum*, as characterized by Linnæus, Swartz, Willdenow, and others. It is readily distinguished from *Polypodieæ*, by the sori being furnished with a special indusium which bears the sporangia in its axis of attachment, or on its inferior disk, and the same character distinguishes it from *Acrostichieæ*, with which tribe *Pteridieæ* is connected through *Lomaria*.

Sect. I. CHILOSOREÆ, *J. Sm.*

Sori marginal, round or elongated, continuous, or interrupted.

49. HYPOLEPIS, *Bernh. Presl.*

Veins forked or pinnate; *venules* direct, their apices free, the lower exterior one sporangiferous; *sori* terminal, round, marginal; *indusium* formed of a reflexed changed venule.

Fronds *from two to six feet high, bi-tripinnate;* laciniæ *crenulated, smooth or pilo-glandulose;* rachis *sometimes aculeate;* sori *situated opposite the sinus of the laciniæ, forming a row on each side of the ultimate midrib.*

Examp. 1. H. tenuifolia, *Bernh.* 2. H. repens, (Lonchitis, *Linn.* Cheilanthes, *Kaulf.*) 3. H. aculeata, (Dicksonia, *Spreng.*)

Illust. Plum. Fil. t. 12. *Hook. Gen. Fil. t.* 67. A. B.

Obs. This genus is formed of a group of species characterized with large decompound fronds, which rise from a lengthened creeping rhizoma, similar in habit to some of the large-fronded species of *Polypodium*, and differing only by the soriferous crenule being altered in texture, and reflexed, forming a simple lateral indusium with the sporangia in its axis, and therefore not distinct in that respect from the following genus *Cheilanthes;* but their whole habit naturally indicates them to be a distinct group from the species which I retain as true *Cheilanthes.* *Hypolepis* may also be considered as having some affinity with the tribe *Dicksonieæ*, especially with the group of which *Dicksoniæ pilosiuscula* is the type, the crenuliform indusium being analogous to the outer or accessary indusium which characterizes *Dicksonieæ.*

50. OCHROPTERIS, *J. Sm.*

(Adiantis, *sp. Sw.*)

Veins pinnately-forked, radiating; *venules* direct, their apices clavate; *sporangia* produced on the base of the indusium which is formed on the converging apices of two to four venules, constituting oblong marginal sori.

Fronds *deltoid decompound;* stipes *and rachis smooth, of a pale colour, ultimate pinnules or laciniæ oblong, obtuse, marginate, cuneate at the base and decurrent, producing a solitary or rarely twin sorus on their apex or sides.*

Species. O. pallens. (Adiantum, *Sw.* Cheilanthes davallioides, *Bory.* " Ad. pallens, *Sw.* habitu et fructificatione ab omnibus diversissimum proprium constituet genus," *Kaulf.*) *Illust.*

Obs. The peculiar and distinct habit is the principal feature that marks this as not forming a natural combination with any of the neighbouring genera. It has hitherto been placed in *Adiantum,* but the situation of the sporangia does not agree with that genus. With more propriety it might be placed in the genus *Pteris* so far as the sori are concerned, but it does not agree with any species of *Pteris* in habit; it may therefore be viewed as forming a transition with these genera through *Onychium.* In habit it comes nearest *Hypolepis,* but differs in the sori being seated on the apices of two to four converging venules, as in some species of *Adiantum.*

51. CHEILANTHES, *Sw. J. Sm.*

Veins forked; *venules* direct, their apices free and sporangiferous. *Sori* round, marginal, solitary or contiguous. *Indusium* usually reniform, rarely oblong, and including more than one sorus.

Fronds *bi-tripinnate, smooth, pilose, glandulose or squamose,* pinnules *sometimes very small and orbicular;* stipes *usually ebeneous.* Sori *often becoming confluent.*

Examp. 1. C. pteroides, *Sw.* 2. C. capensis, *Sw.* 3. C. radiata (Adiantum, *Linn.*, *Sw.*, *Willd.*) 4. C. odora, *Sw.* 5. C. fragrans, *Sw.* 6. C. viscosa, *Link.* 7. C. spectabilis, *Kaulf.* *Illust. Hook. gen. fil. ined. Plum. fil. t.* 100.

Obs. The technical distinction between this and the following genus depends in a great measure upon the ultimate segments or laciniæ of the fronds of *Cheilanthes* being more crenate and sinuous than in the greater number of the species of *Cassebeera*, which genus is characterized with a continuous indusium and this happens by the margin being straight or but slightly sinuous, but there are instances of the indusium of some species of *Cheilanthes*, including more than one sorus which clearly shows that the two genera are in that respect scarcely distinct.

52. CASSEBEERA, *Kaulf. J. Sm.*

(Allosoreæ *sp. Presl.*)

Veins forked; *venules* direct, their apices free and sporangiferous. *Sori* round, distinct, or contiguous and confluent, constituting a linear continuous or interrupted compound marginal sorus. *Indusium* linear, plane, plicate or vaulted.

Fronds *palmate, pinnate, bipinnatifid or bi-tripinnate, smooth or squamose, rarely farinose;* stipes *rigid and ebeneous;* pinnæ *usually articulated with the rachis.* Indusium *attached transversely across the sporangiferous apices of the venules, sometimes very narrow, rarely slightly intramarginal and conniving with the opposite sorus.*

Examp. 1. C. triphylla, *Kaulf.* 2. C. pedata (Pteris, *Linn.*) 3. C. argentea (Pteris, *Linn.*) 4. C. farinosa (Pteris, *Sw.*) 5. C. inframarginalis (Pteris, *Kaulf.*) 6. C. pinnata, *Kaulf.* 7. C. hastata, (Pteris, *Sw.*) 8. C. cuneata (Cheilanthes, *Kaulf.*) 9. C. microphylla (Cheilanthes, *Link.*) 10. C. tenuifolia (Cheilanthes, *Sw.*) *Illust. Hook. gen. fil. t.* 66. A.

Obs. On comparing the *Adiantoid* section of *Pteris*, and part of *Cheilanthes* with the original species of *Cassebeera*, I find that several of the species of both these genera so well agree in habit and structure of the sori, that I have been induced to place them under *Cassebeera;* but setting habit aside, the formation of the sorus in some of the species is scarcely sufficiently distinct from *Pteris* as here restricted.

53. PLATYLOMA, *J. Sm.*

(Pterideæ *sp. Auth.* Allosoreæ *sp. Presl.*)

Veins forked; *venules* direct, their apices free and sporangiferous. *Sori* oblong, laterally confluent, constituting a broad continuous compound marginal sorus.

Fronds *pinnate or bipinnate;* stipes *generally ebeneous, smooth, pilose or squamiferous.* Pinnæ *articulated with the rachis.* Sporangia *occupying a portion of the upper part of the venules which by their closeness to one another, form a broad, compound receptacle, with the indusium attached transversely on its outer margin.*

Examp. 1. P. Brownii, *J. Sm.* (Adiantum paradoxum, *R. Br.* Pteris latizona, *A. Cunn.*) 2. P. falcata, (*R. Br.*) 3. P. rotundifolia, (*Forst.*) 4. P. albida, (*A. Cunn.*) 5. P. atropurpurea, (*Linn.*) 6. P. sagittata, (*Cav.*) 7. P. cordata, (*Cav.*) 8. P. andromedæfolia, (*Kaulf.*) *Illust. Hook. gen. fil. ined.*

Obs. The ebeneous habit of this genus shows its close affinity with *Cassebeera* on the one hand, and with *Adiantum* on the other, differing from the first by its broad sorus, and from *Adiantum* chiefly by the compound receptacle of *Platyloma* not being so much altered in texture and reflexed as the venose receptacle or indusium of *Adiantum*, and although there is little or no affinity in habit between this genus and *Allosorus*, yet the character of the sori is analogous.

54. ADIANTUM, *Linn. J. Sm.*

Costa excentric or wanting; *veins* unilateral or radiating, forked; *venules* direct, their apices terminating in the axis of the *indusium*, which is venose and sporangiferous on its under side, at length replicate, constituting round, reniform, oblong or linear continuous marginal sori.

Fronds *varying from simple reniform to decompound.* Stipes *and rachis ebeneous usually smooth.* Pinnæ *generally oblique, truncate or cuneate at the base, or dimidiate and soriferous on the upper margin only*; petiole *articulated with the rachis or base of the lamina.*

Examp. 1. A. reniforme, *Linn.* 2. A. lunulatum, *Burm.* 3. A. macrophyllum, *Sw.* 4. A. pedatum, *Linn.* 5. A. Capillus veneris, *Linn.* 6. A. formosum, *R. Br. Illust. Schk. Crypt. t.* 115 *to* 122. *Hook. et Grev. ic. fil. t.* 132. *Hook. gen. fil. t.* 66. B.

Obs. This extensive natural genus contains about seventy described species, and is readily distinguished from its allies by the sporangia being produced on the under side of the indusium, which is either formed of a reflexed crenule, and then reniform, or it is oblong or linear, according to the more or less entire or crenulate character of the margin of the frond. The species with reniform indusia are distinguished from those species of *Cheilanthes* which have a similar indusium, not only by the indusium being sporangiferous but also by its being produced on the converging apices of two or more venules, whereas the sori of *Cheilanthes* are seated on the apices of single venules, which terminate in the axis of the indusium; therefore *Adiantum radiatum* of Linnæus is in accordance with that character a true *Cheilanthes.*

55. HEWARDIA, *J. Sm.*

Costa central; *veins* uniform, reticulated, forming elongated oblique areoles. *Indusium* marginal venose and sporangiferous on its under side, at length replicate and involute, constituting a linear continuous marginal sorus.

Fronds *from* 1 *to* 2 *feet high, stipitate, dichotomous, the branches* 6 *to* 8 *inches long and pinnate.* Pinnæ *alternate, petiolated,* (*but not articulated*) *ovate-elliptical, oblique at the base,* 4 *to* 5 *inches long by two inches wide, the midrib disappearing towards the apex of the pinnæ.* Sori *continuous on both margins.*

Species. H. adiantoides, *J. Sm. in Hook. Journ. of Bot. Illust. Hook. Journ. of Bot. v.* iii. *t.* 16, 17. *Hook. Gen. Fil. t.* 89.

Obs. This very distinct genus is founded upon a solitary species found in Guiana, of which I have seen only one specimen, and which at first sight might be taken for a large pinnate species of *Adiantum*, having the smooth ebeneous character of that genus, but from which it is distinguished by its reticulated venation; and its venose sporangiferous indusium will distinguish it from any of the proximate genera with continuous marginal sori.

56. AMPHIBLESTRA, *Presl.*

Veins costæform, pinnate; *venules* transversely and irregularly anastomosing, producing variously directed simple or forked free veinlets which terminate in the areoles. *Sporangiferous receptacle* transverse, marginal, constituting a linear continuous sorus. *Indusium* narrow, linear.

Fronds 2 *feet or more high, stipitate, tripartite, branches pinnate, pinnatifid towards the apex.* Pinnæ *ovate-oblong, acuminate, repand-dentate,* 8 *inches long by* 2 *to* 3 *wide, the terminal one broad and auriculated at the base.*

Species. A. latifolia, *Presl.* (Pteris, *Humb.*) *Illust. Presl, Pterid. t.* 6. *f.* 1.

Obs. I have not had the opportunity of examining this fern, and have consequently adopted the genus entirely upon the authority of Presl aided by Humboldt's description of the species; and what is singular is in its being the only known example in *Pterideæ* having a venation similar to the extensive genus *Drynaria* in *Polypodieæ*, and *Gymnopteris* in *Acrostichieæ*.

57. DORYOPTERIS, *J. Sm. in Hook. Journ. of Bot.*

(Pteridis *sp. Linn. Radd.* Litobrochiæ *sp. Presl.*)

Venation internal, nearly uniform, reticulated, areoles elongated, oblique. *Sporangiferous receptacle* transverse marginal, constituting a linear continuous sorus. *Indusium* narrow, linear.

Fronds *simple, cordate, lobed or digitate-palmate, smooth, coriaceous.* Stipes *and* costa *ebeneous.* Veins *hidden within* *the substance of the frond.* Sporangiferous receptacle *distinct, elevated.*

Examp. 1. D. sagittifolia; (*Radd.*). 2. D. hastata; (*Radd.*) 3. D. palmata; (*Willd.*) 4. D. collina; (*Radd.*). 5. D. varians; (*Radd.*). 6. D. Wallichii, *J. Sm.* 7. D. cordifolia; *J. Sm. Illust. Radd. Bras. fil. t.* 63, 64, 65. *Hook. gen. fil. t.* 65. B. *f.* 1.

Obs. The smooth, ebeneous stipes, and coriaceous texture of this genus is similar to *Platyloma*, and some species of *Cassebeera*, but its reticulated veins readily distinguish it from these two genera. From the following it is not so obviously distinct either in venation or in the sori, but the habit of the several species are quite distinct from *Litobrochia*, and clearly indicate a separate and natural group.

58. LITOBROCHIA, *Presl, J. Sm.*

(Pteridis *sp. Linn. and Auth.* Campteria, *Presl.*)

Venation external, elevated, arcuately or angularly reticulated; *areoles* unequal. *Sporangiferous receptacle* transverse marginal, constituting a linear continuous or interrupted sorus. *Indusium* narrow, linear.

Fronds *from* 1 *to* 8 *feet high, pinnate or bi-tripinnate, ultimate pinnæ usually pinnatifid.* Veins *evident, sometimes only the venules next the midrib or margin anastomosing.*

Examp. 1. L. splendens; (*Kaulf.*). 2. L. grandifolia; (*Linn.*). 3. L. ampla; (*Kunze.*). 4. L. Hænkeana; *Presl.* 5. L. denticulata; (*Sw.*) 6. L. macilenta; (*A. Rich.*) 7. L. spinulosa; (*Radd.*) 8. L. aculeata; (*Sw.*) 9. L. polita; (*Link.*). 10. L. decurrens; *Presl.* 11. L. macroptera; (*Link.*). 12. L. podophylla; (*Sw.*). 13. L. vespertilionis; (*Labill.*). *Illust. Hook. et Grev. Ic. Fil. t.* 28. *Schk. Crypt. t.* 92. *Hook. Gen. Fil. t.* 65. B. *f.* 6.

Obs. This is an extensive genus, usually characterized with large branching compound fronds of a flaccid texture, with superficial anastomosing or reticulated veins which distinguish it from *Doryopteris*, and true *Pteris*.

The genus *Campteria* of Presl is founded upon three species in which the lower venules next the midrib only anastomose; but this seems to me not sufficient reason to warrant their separation from *Litobrochia*, especially as they differ in no respect in habit from many species of that genus.

59. LONCHITIS, *Linn. J. Sm.*

Venation reticulated; *areoles* unequal; *sporangia* produced on the apices of 4—5 convergent venules which terminate in the sinus of the laciniæ, forming oblong or linear-arcuate marginal sori. *Indusium* linear.

Fronds 2 *to* 6 *feet high, pinnate or bipinnate, pinnæ sinuous or pinnatifid, usually pubescent.*

Species. 1. L. aurita, *Linn.* 2. L. pubescens, *Willd.* 3. L. glabra, *Sw.* *Illust. Plum. Fil. t.* 17. *Schott, gen. fil. t.* 15. *Hook. Gen. Fil. t.* 68. A.

Obs. The few species which constitute this genus agree in habit with the preceding genus, and differ only in the sorus being situated in, and not extending much beyond, the curve which is formed by the sinus of the laciniæ, and by being so situated assuming the form of a segment of a circle; whereas in *Litobrochia*, the sori occupy more or less of the sides of the laciniæ. By restricting *Lonchitis* to the above character excludes from it the *L. hirsuta*, and *L. pedata* of Linnæus, the first being a *Litobrochia*, and the other a true *Pteris*.

60. PTERIS, *Linn. J. Sm.*

(Pteridis *sp. Presl.* Allosoreæ *sp. Presl.*)

Veins forked; *venules* direct, their apices combined by a transverse sporangiferous receptacle, constituting a linear continuous or interrupted marginal sorus. *Indusium* linear, its base often sporangiferous.

Fronds *varying from a few inches to* 10 *feet high, and from pinnate to decompound, the ultimate pinnæ usually lobed or equally pinnatifid, smooth, rarely pubescent.* Sori *continuous or occupying the sides of the laciniæ only.*

Examp. 1. P. longifolia, *Linn.* 2. P. costata, *Bory.* 3. P. amplectens, *Wall.* 4. P. cretica, *Linn.* 5. P. umbrosa, *R. Br.* 6. P. serrulata, *Linn.* 7. P. heterophylla, *Sw.* 8. P. irregularis, *Kaulf.* 9. P. pungens, *Willd.* 10. P. biaurita, *Linn.* 11. P. arguta, *Vahl.* 12. P. hirsuta, (Lonchitis, *Linn.*) 13. P. tremula, *R. Br.* 14. P. esculenta, *Forst.* 15. P. caudata, *Linn.* 16. P. aquilina, *Linn.* *Illust. Schk. crypt. t.* 88. *Hook. et Grev. Ic. Fil. t.* 130. *Hook. Gen. Fil. t.* 64. A.

Obs. The original character of this genus as given by Linnæus, Swartz, and others, consisted in the sporangia being situated in the axis of an exterior attached lateral indusium, constituting a linear marginal sorus, which character would now embrace above 150 known species; but, by adopting a few other points of structure, we have been enabled to divide that number into several generic groups characterized under *Cassebeera*, *Platyloma*, *Doryopteris*, *Litobrochia*, and *Pteris*, as now here characterized, and which still contains the greatest number of species.

Presl separates the *Pteris aquilina* of Linnæus and its associates from this genus, and places them under his genus *Allosorus*, which must be confessed is composed of rather a heterogeneous mass of species, not only of distinct habits, but also differing in other important characters, which render the adoption of the genus so constituted inadmissible. Some observers have stated, that the sori of *Pteris aquilina* are furnished with a narrow indusium, situated on the inner side of the receptacle, but from my observation, I cannot consider the slightly elevated fimbriate ridge which bounds the inner side of the sporangia as being analogous to an indusium. And although the group of which *P. aquilina* is the type, is somewhat different in habit from the rest of the genus, yet I do not find sufficient character to allow them to be considered otherwise than as constituting a group of this genus under the sectional name *Ornithopteris* of Agardh.

61. ONYCHIUM, *Kaulf.*

(Leptostegia, *D. Don.* Alosoreæ *sp. Presl.*)

Veins simple direct, free, or their apices combined by a transverse sporangiferous receptacle, seated in the axis of a linear, slightly intramarginal indusium.

Fronds *deltoid, decompound-multifid, segments linear-lanceolate;* sori *short, contiguous, the indusia conniving, forming as it were but one sorus on each segment;* sporangia *usually becoming confluent, covering the whole disk between the two indusia.*

Species. 1. O. auratum, *Kaulf.* 2. O. lucidum, *Spreng.* (Leptostegia, *D. Don.*) 3. O. capense, *Kaulf.*

Illust. Bauer's Gen. Fil. t. 11. *Hook. et Grev. Ic. Fil. t.* 107.

Obs. The very distinct habit of the few species constituting this genus renders it necessary to separate them from both *Pteris* and *Lomaria*, in which they have by some been placed. From *Pteris*, this genus is distinguished by the fertile segments being so narrow that the two sori are confluent, the free margins of the two indusia, conniving over the midrib, at length opening as it were by a longitudinal suture. From *Lomaria* it differs in the sporangia being seated in the immediate axis of the indusium as in *Pteris*, whereas in *Lomaria* the receptacle is broad, and occupies nearly the whole space between the midrib and axis of the indusium. *Onychium* therefore appears to form the transition between *Pteris* and *Lomaria*, through such species as *Pteris heterophylla* and *crenata*, with *Lomaria Fraserii.*

SECT. II. METASORÆ, *J. Sm.*

Sori intramarginal or costal, elongated, oblong or linear, and continuous; *indusium* plain or vaulted.

62. LOMARIA, *Willd.*

(Stegania, *R. Br.*)

Veins (of sterile fronds,) forked; *venules* direct, free; *fertile fronds* contracted; *veins* scarcely evident; *sporangiferous receptacle* thick and elevated, continuous, often occupying nearly the whole disk; *indusium* seated on, or within the edge of the thickened margin, vaulted, revolute, and conniving at length, replicate and torn.

Fronds *pinnatifid or pinnate, rarely simple or bipinnatifid, segments of the sterile fronds entire or serrulate, apices of the venules clavate, terminating in the margin, which is often cartilaginous and slightly revolute;* fertile segments *linear, becoming wholly covered by the confluent sporangia.*

Examp. 1. L. Patersoni, (*R. Br.*) 2. L. lanceolata, (*R. Br.*) 3. L. fluviatilis, (*R. Br.*) 4. L. onocleoides, *Spreng.* 5. L. Boryana, *Willd.* 6. L. discolor, *Willd.* 7. L. spicans, *Desv.* 8. L. procera, (*R. Br.*) 9. L. Chilensis, *Kaulf.* 10. L. Fraserii, *A. Cunn.*

Illust. Schk. crypt. t. 110. *Hook. Gen. Fil. t.* 64. B.

Obs. This is a very natural genus, containing a considerable number of species of great uniformity of habit, distinguished from *Pteris* by the fertile fronds being contracted, with the sporangia seated on a broad thickened receptacle; but there are exceptions to either of these characters being truly definite; for the fertile fronds of *Pteris crenata, heterophylla,* and some others, are contracted, and in *Lomaria Gilliesii, Fraserii,* and others, the receptacle is narrow and seated in the immediate axis of the indusium, but in no instance is the sporangia seated on the base of the indusium as in many species of *Pteris.* The broad receptacle, which is the true character of the genus, has great analogy to the amorphous receptacle of *Acrostichieæ,* with which tribe *Lomaria* forms a transition through *Stenochlæna.*

63. BLECHNUM, *Linn.*

(Sadleria, *Kaulf.*)

Veins forked; *venules* (sterile,) direct, free; *fertile venules* combined near their base by a transverse sporangiferous receptacle, constituting a linear continuous costal sorus; *indusium* linear, plain, conniving with the costa.

Fronds *pinnatifid or pinnate, rarely simple or bipinnatifid, generally smooth, with entire or serrulate margins;* soriferous receptacle *crossing the veins at their point of forking, which is usually close to the midrib;* sori *sometimes interrupted and seated some distance from the midrib.*

Examp. 1. B. australe, *Linn.* 2. B. occidentale, *Linn.* 3. B. orientale, *Linn.* 4. B. striatum, *R. Br.* 5. B. longifolium, *Humb.* 6. B. hastatum, *Kaulf.* 7. B. corcavadense, *Radd.* 8. B. Fontanesianum, *Gaud.* (Sadleria cyatheoides, *Kaulf.*) *Illust. Schk. crypt. t.* 108, 109. *Hook. et Grev. Ic. Fil. Hook. Gen. Fil. t.* 54. B.

Obs. The habit and venation of this genus is similar to *Lomaria;* but from that genus *Blechnum* differs not only in its fertile fronds not being contracted, but also in the venules being continued beyond the soriferous receptacle, and terminating in the margin, which is not the case in *Lomaria.* The only doubtful species of the genus is *B. Fontanesianum*, which differs from the rest of the genus in the fronds being bipinnatifid, coriaceous, and rigid, the laciniæ concave, and the sporangia produced on a very thick receptacle, close to the midrib, which is much elevated, the indusium is also coriaceous. These characters induced Kaulfuss to form this species into a genus which he named *Sadleria*, and which I should be glad to retain, but at present I cannot satisfy myself that there is any peculiarity besides texture whereby to characterize it as different from *Blechnum.*

64. SALPICHLÆNA, *J. Sm.*

Blechni *sp. Kaulf.*

Veins forked; *venules* direct, their apices combined by a transverse marginal vein, and their base combined by a transverse sporangiferous receptacle, constituting a linear continuous costal sorus; *indusium* revolute, vaulted, cylindrical, its base sporangiferous

Fronds *flexuous, climbing by the aid of the petioles, bipinnate;* pinnæ *consisting of usually two to four pairs of pinnules, which are nearly opposite, distant, membraneous, linear-lanceolate, acuminate, four to six inches long, margin plain or repand-undulate, sometimes slightly revolute and indusiiform;* special indusium *inflated, of a brown colour.*

Species. S. volubile, *J. Sm.* (Blechnum volubile, *Kaulf.*) *Illust. Kunze's analecta pteridog, t.* 13. *Hook. Gen. Fil. t.* 93.

Obs. The climbing habit of this fern is so much like the genus *Lygodium*, that at first sight it might be taken for a species of that genus. From *Blechnum* it is not only distinguished by its climbing habit, but also by the venules being combined by a transverse slightly intramarginal vein, and by its conspicuous cylindrical tube-like indusium bearing a portion of the sporangia along its lengthened attachment or base. Specimens of this Fern were presented me by J. Miers, Esq., who informs me that it climbs to the tops of lofty trees in Brazil.

65. DOODIA, *R. Br. J. Sm.*

Veins forked; *venules* arcuately anastomosing near their base, then direct and free towards the margin; *sporangia* produced on the transverse anastomoses, constituting a transverse row of oblong, straight or arcuate sori; *indusium* plain.

Fronds *rigid, pinnatifid or pinnate, margin spinulous, the pinnæ rarely pinnatifid;* fertile frond *sometimes contracted;* sori *rarely in two rows.*

Species. 1. D. aspera, *R. Br.* 2. D. Kunthiana, *Gaud.* 3. D. blechnoides, *A. Cunn.* 4. D. media, *R. Br.* 5. D. caudata, *R. Br.* 6. D. virginica, (Woodwardia, *Sw.*)

Illust. Hook. Gen. Fil. t. 54. *A. Gaud. in Freyc. Voy. t.* 14.

Obs. Agreeing in habit with *Blechnum*, but distinguished from that genus by the sori not being continuous; but that character is not always to be depended upon, for *Blechnum hastatum* often exhibits sori of the same form, and distant from the midrib as in *Doodia*. With *Lomaria* this genus is connected through *D. caudata*, which has somewhat contracted fronds, with the sori nearly continuous. Sometimes *Doodia* also presents a structure analogous to the following genus, by the venules forming a second or exterior anastomose, which anastomose is usually fertile, and therefore constituting two transverse rows of sori.

66. WOODWARDIA, *Sm.*

Veins reticulated; *venules* free exteriorly; *sporangia* produced on the transverse costal anastomoses, constituting a row of oblong, linear, contiguous immersed sori; *indusium* revolute, vaulted.

Fronds *pinnate or bipinnatifid, uniform, or the fertile contracted, margin serrulate or spinulous.*

Species. 1. W. onocleoides, *Willd.* 2. W. thelypteroides, *Pursh.* 3. W. Japonica, *Sw.* 4. W. radicans, *Sw.*

Illust. Schk. crypt. t. 111, 113. *Bauer's Gen. Fil. t.* 17.

Obs. The more compound anastomosing of the veins, the sporangia being deeply immersed, and the revolute vaulted indusium, are the principal points of difference between this genus and the foregoing.

Tribe IV. ASPLENIEÆ, *J. Sm.*

Sori elongated, oblique to the midrib or axis of venation. *Venules* free or anastomosing, sporangiferous on their superior or inferior sides (*unilateral*), or on both sides (*bilateral*), constituting simple or binate sori, each furnished with a special lateral attached linear plane or vaulted indusium.

Obs. The technical distinction between this tribe and the preceding, is in the sori of *Asplenieæ* being produced on the sides of free or combined venules, and forming an angle more or less oblique with the midrib or axis of venation, and therefore never parallel with the midrib or margin as in *Pterideæ.*

This tribe contains about 200 described species, which have hitherto been principally included under the two genera, *Asplenium* and *Diplazium* of authors; the first characterized by the venules being sporangiferous on their superior or inner sides only, whereas the species constituting *Diplazium* produce sporangia on each side of the venule, each side being also furnished with its own indusium, the margin of the one free superiorly, and the other inferiorly, which character is in a number of species very constant to all the fertile venules; but in a greater number of species, the twin or binate sorus is found only on the lower or primary venules, the superior ones producing a single superior sorus as in true *Asplenium.* Another form of double or twin sori is exhibited by the superior and inferior venules of each two fascicles being sporangiferous, the one on its superior and the other on its inferior side, (that is, on the sides facing each other,) and by their parallel proximity the sori are confluent, the free margins of the two indusia conniving and are even imbricate; at length opening as it were by a central longitudinal fissure, and therefore in appearance constituting only one sorus, this structure characterizes the genus *Scolopendrium* of Sir J. E. Smith. Besides these three forms of sori, there are a number of species which have the ultimate divisions of their fronds narrow, and producing only one sorus on each lacinia or segment, which solitary sorus is all that characterizes the genus *Darea* of Willdenow, but which I consider as only forming a group of true *Asplenium*. The genus *Acropteris* of Link is founded upon three small species having forked or digitate fronds, the segments or laciniæ being linear and narrow, so that only two nearly parallel veins are produced from the base of each, and which are fertile on the sides facing each other, with the indusia conniving as in *Scolopendrium*, or even analogous to *Blechnum;* but judging from their habit, these species must be viewed as the simple or reduced form of an extensive group of *Asplenium*, which have præmorse forked segments, with the venules diverging in a forked and digitate manner from the base or axis, the midrib being generally evanescent or wanting. On viewing the original species constituting the genus *Allantodia* of Mr Brown, they are found to agree so much in character with the species which Roth and other authors have characterized under *Athyrium*, that it appears to me necessary to associate them together; and as regards *Athyrium*, as a genus, I must confess that I cannot value it otherwise than as constituting another group of *Asplenium*, the only character being in the vaulted or cylindrical indusium, which is a form not uncommon to many other species of *Asplenieæ*. From these observations it may be inferred, that the structure of the sori and indusium affords but slight generic distinctions; which is the more to be regretted, as the venation in the greater mass of the species is uniformly direct and free: but there are a few species which have variously anastomosing veins, which, taken in conjunction with the slight different modifications of the sori, as above noticed, afford sufficient character whereupon to constitute a few small natural genera.

Sect. I. ORTHOPHLEBIEÆ.

Venation free, none of the venules anastomosing.

67. SCOLOPENDRIUM, *Sm.*

Veins forked; ***venules*** direct, free, parallel, the superior and inferior branch of each fascicle approximating and sporanguiferos on their proximate sides, constituting unilateral linear sori, confluent in pairs. ***Indusia*** linear, the free margins of each pair conniving, forming as it were one sorus.

Fronds ***linear-lanceolate, plane or undulate, and divided at the apex, usually cordate at the base, or pinnate.***

Species. 1. S. officinarum, ***Sm.*** 2. S. Hemionitis, ***Cav.*** 3. S. pinnatum, ***J. Sm.***

Illust. Schk. Crypt. t. 83. b. 84. ***Hook. gen. fil. t.*** 57. B.

Obs. This genus has been separated from ***Asplenium*** by the sori being confluent in pairs, although they appear as but one sorus with the indusium opening longitudinally in the middle; but which consists of two separate indusia, attached on the opposite sides of the two sporangiferous venules.

68. DIPLAZIUM, *Sw. J. Sm.*

Veins forked or pinnate; ***venules*** direct, free, all or the lower ones only sporangiferous on both sides, constituting binate, or simple, superior linear sori. ***Indusia*** generally plain, linear.

Fronds ***simple, pinnate, or bi-tripinnatifid, from*** 1 ***to*** 6 ***or*** 8 ***feet high, usually smooth.*** Sori ***generally decussate.***

Examp. 1. D. plantagineum, *Sw.* 2. D. integrifolium, ***Blume.*** 3. D. grandifolium, *Sw.* 4. D. porrectum, *Wall.* 5. D. juglandifolium, ***Sw.*** 6. D. undulosum, *Sw.* 7. D. frondosum, *Wall.* 8. D. arborescens, *Sw.*

Illust. Schk. Crypt. t. 75, 76, 85. *Hook. gen. fil. t.* 55. B. 56, B.

Obs. Swartz first separated this as a genus from *Asplenium*, by the circumstance of the sori being double, which character embraces a considerable number of species; but in many of them the double or binate sori are produced only on the lower exterior venule of each fascicle, the other venules producing a single unilateral sorus on the superior side only as in true *Asplenium;* therefore if it were not for the sake of having some character whereby to divide the old extensive genus *Asplenium*, the circumstance of double sori would be unworthy of notice as a generic distinction. Some of the original species of *Diplazium* are by the above character now excluded, and constitute the genus *Callipteris*, which is characterized by having anastomosing venules.

69. ASPLENIUM, *Linn. J. Sm.*

(Acropteris, *Link.* Darea, *Willd.* Cænopteris, *Berg.* Athyrium, *Roth.* Allantodiæ sp. *R. Br.*)

Veins forked or pinnate; *venules* direct, free, sporangiferous on their superior side, constituting unilateral linear sori. *Indusium* plain or vaulted, and cylindrical.

* ASPLENIA VERA.

Fronds *simple or pinnate, margin entire or crenate.* Sori *usually equal on both sides of the midrib.*

Examp. 1. A. Phyllitidis, *Wall.* 2. A. vittæforme, *Cav.* 3. A. serratum, *Linn.* 4. A. Brasiliense, *Sw.* 5. A. attenuatum, *R. Br.* 6. A. oligophyllum, *Kaulf.* 7. A. marinum, *Linn.* 8. A. Trichomanes, *Linn.*

Illust. Schk. Crypt. t. 67, 69. *Hook. et Grev. Ic. Fil. t.* 137, 220.

** ACROPTERIS, *Link. J. Sm.*

Fronds *simply forked or digitate, pinnate or bipinnate, segments serrate, or primarily laciniated;* costa *undefined or wanting;* veins *radiating from the base of the segments, or forming an acute angle with the evanescent costa.*

Examp. 9. A. septentrionale, *Sw.* 10. A. australe, *Sw.* 11. A. radiatum, *Sw.* 12. A. Ruta-muraria, *Linn.* 13. A.

Canariense, *Willd.* 14. A. præmorsum, *Sw.* 15. A. falcatum, *Lam.* 16. A. serra, *Lang. et Fisch.*

Illust. Hook. Gen. Fil. t. 30. *Hook. et Grev. Ic. Fil. t.* 136.

*** DAREA, *Willd.*

Fronds *simple, acutely laciniated, pinnate or bi-tripinnatifid;* sori *usually solitary in each ultimate segment.*

Examp. 17. A. flaccidum, *Forst.* 18. A. Odontites, *R. Br.* 19. A. laxum, *R. Br.* 20. A. rutæfolium, (*Willd.*) 21. A. bulbiferum, *Forst.* 22. A. diversifolium, *Cunn.* 23. A. rhizophyllum, (*Cœnopteris, Sm.*) 24. A. myriophyllum, *Spreng.*

Illust. Hook. Gen. Fil. t. 6. *Hook. et Grev. Ic. Fil. t.* 193.

**** ATHYRIUM, *Roth.*

Fronds *bi-tripinnatifid, ultimate segments dentate or deeply laciniated;* sori *short, generally occupying the middle or lower part of the venules, sometimes the lower exterior venules soriferous on both sides;* indusium *vaulted, its extremities free.*

Examp. 25. A. fontanum, *R. Br.* 26. A. filix-fœmina, *R. Br.* 27. A. Athyrium, *Spreng.* 28. A. Brownii, *J. Sm.* (Allantodia australis, *R. Br.*) 29. A. umbrosum, (Allantodia, *R. Br.*) 30. A. spectabile, (Allantodia, *Wall.*) 31. A. multicaudatum, (*Wall.*) 32. A. incisum, (Allantodia, *Wall.*)

Illust. Hook. Gen. Fil. t. 16. *Schk. crypt. t.* 58, 59.

Obs. The circumstance of some of the species of this section having very short sori, with the ends of the indusium free and curved, is somewhat analogous to *Nephrodium* and *Cystopteris* in the following tribe; but the difference of attachment of the indusium readily distinguishes them. For further observations respecting *Asplenium*, see page 171.

SECT. II. SYMPLOPHLEBIEÆ.

Venation variously anastomose, or reticulated.

70. CETERACH, *Willd. J. Sm.*

(Gymnogrammatis sp. *Spreng. Presl.*)

Veins forked; *venules* anastomosing; *sporangia* unilateral;

sori oblong, protruding through dense elongated scales; *indusium* obsolete.—Fronds 2 *to* 8 *inches long, linear, sinuous, pinnatifid, or pinnate, coriaceous, the under side densely covered with elongated fringed scales;* veins *digitately branched, the branches anastomosing, the lower exterior one sporangiferous on the side facing the primary midrib of the frond.*

Species. 1. C. officinarum, *Willd.* (Asplenium Ceterach, *Linn.* Grammitis Ceterach, *Sw.* Scolopendrium Ceterach, *Sm.*) 2. C. cordata, (Acrostichum, *Linn.* Grammitis, *Sw.* Notholæna, *Desv.* Gymnogramma, *Spreng.* Ceterach crenata, *Kaulf.*)

Illust. Schk. crypt. t. 7. *b. Hook. et Grev. Ic. Fil. t.* 156. *Newman's Brit. Ferns, p.* 85.

Obs. The synonyms given to the two species of this genus will show the several opinions of authors as regards their affinity and their value, viewed as a distinct genus; but in my opinion, the unilateral sporangia clearly point out their relationship to be with *Asplenium* rather than with any genus near *Grammitis;* the absence of the indusium being, according to my view, entirely owing to its being suppressed by the density of the scales, which particularly characterize these two species, and which is analogous to the *Lepicystis* section of *Goniophlebium* in *Polypodieæ*. In *Ceterach officinarum* the venules are combined, a character not before noticed. I have not yet had sufficient evidence to say whether or not a like structure characterizes *C. cordata;* but however unsatisfactory the generic character of *Ceterach* may be, yet it appears to me on viewing every point of structure, that enough is known to warrant their separation from any of the genera in which they have hitherto respectively stood. By Presl retaining it in *Gymnogramma,* he shows that he had not examined the venation with that attention which the subject requires.

71. NEOTTOPTERIS, *J. Sm.*

(Asplenii *sp. Linn.* and *authors.*)

Veins forked; *venules* direct, parallel, sporangiferous on their superior side, their apices combined by a transverse continuous anastomosing vein; *sori* unilateral, linear, parallel; *indusium* plane; fronds *cæspitose, simple, linear-lanceolate, coriaceous, smooth, marginate, from* 1 *to* 3 *feet in length by* 4—6 *inches wide.*

Species. 1. N. vulgaris, *J. Sm.* (Asplenium Nidus, *Linn.*) 2. N. musæfolia, *J. Sm.* 3. N. Phyllitidis, (*D. Don.*) 4. A. Grevillii, (*Wall.*) 5. N. stipitata, *J. Sm.*

Illust. Hook. Gen. Fil. ined.

Obs. The habit of the few species constituting this genus naturally indicates them to be distinct as a genus from any of the preceding genera, and they are readily recognised by the apices of the venules being combined by a marginal vein; the only character that distinguishes this genus from at least two species of *Asplenium*, which are nearly of the same habit with *Neottopteris.* There is a structure worthy of notice as regards the axis of venation, and which is well exemplified in *Neottopteris;* the midrib of which is large, prominent, and triangular, the lower part being furnished with two distinct vascular chords, imbedded in the cellular structure; higher up they unite, a section exhibiting the appearance of the two letter c's, joined back to back thus ɔc, the superior margin of each producing the veins which diverge to their respective sides, and each fascicle parts into two or three branches (forked), which forking takes place entirely within the substance of the midrib; therefore in such cases, veins are apt to be considered much more simple in their parts than they truly are.

72 ANTIGRAMMA, *Presl, J. Sm.*

(Asplenii *sp. Authors.* Camptosorus, *Link. Presl.*)

Veins forked; *venules* angularly anastomosing and reticulated, the marginal veinlets free. *Sporangia* produced on the proximate sides of the primary venules of each fascicle, constituting unilateral linear sori, usually confluent in pairs. *Indusia* linear, the free margins of each pair conniving.

Fronds *simple, lanceolate, cordate, entire or sinuous, smooth.*

Examp. 1. A. rhizophylla, (*Linn.* Camptosorus, *Link.*) 2. A. repanda, *Presl.* 3. A. Douglasii (*Hook. et Grev.*)

Illust. Hook. et Grev. ic. fil. t. 150. *Hook. ic. Plant. t.* 183. *Hook. gen. fil. t.* 57. A. *and* C.

Obs. The reticulated venation distinguishes this genus from *Scolopendrium*, both agreeing in having twin sori facing each other. The somewhat divergence of the sori in *A. rhizophylla*, is in my opinion not sufficient character to allow of its separation as a genus, especially as such divergence may be viewed as the result of the shorter angular anastomosing of the venules, caused by the usual narrow and lobed nature of the frond.

73. ALLANTODIA, *R. Br. Wall. J. Sm.*

Veins forked; *venules* angularly anastomosing and reticulated, the marginal veinlets free. *Sporangia* produced on the superior side of the alternate primary venules, constituting unilateral linear sori. *Indusium* vaulted, cylindrical.

Fronds *pinnate,* 1 *to* 2 *feet long, pinnæ linear-lanceolate, entire, smooth.*

Species. A. Brunonis, *Wall. Illust. Wall. Pl. As. rar. ic. t.* 52.

Obs. I have already noticed that the original species of this genus as constituted by Mr Brown, agree in habit and form of venation with the species that Roth had previously characterized as a genus under the name of *Athyrium*, which I have already given as forming a section of the genus *Asplenium*, and which also includes Mr Brown's original species of *Allantodia*, that genus being here restricted to one known species differing entirely in habit and venation from *Athyrium*.

74. HEMIDICTYUM, *Presl, J. Sm.*

Asplenii *sp. Linn.*

Veins forked; *venules* parallel till near the margin, then anastomosing and reticulated, combined by a transverse continuous marginal vein. *Sporangia* produced on the superior side of the parallel venules, constituting unilateral linear sori. *Indusium* plain.

Fronds *pinnate,* 12 *to* 14 *feet long;* pinnæ *sessile cordate, from* 1 to 1½ *foot long by* 4—5 *inches wide.* Sori *linear, produced on the straight parallel portion of the venule, from near the midrib to their point of anastomosing.*

Species. 1. H. marginatum, (*Linn.*) *Illust. Plum. fil. t.* 106. *Hook. gen. fil. t.* 55.

Obs. The technical character that distinguishes this fine fern as a genus distinct from the preceding is, in the exterior margin of the reticulated venation being combined by a continuous vein, parallel with and close to the margin, and also by its plane indusium.

75. OXYGONIUM, *Presl, J. Sm.*

(Diplazii *sp. Presl, Wall.* Callipteris, *J. Sm. in Journ. of Bot.*)

Veins pinnately-forked; *venules* parallel till near the margin, then anastomosing, and reticulated, terminating with free marginal veinlets. *Sporangia* bilateral, constituting binate linear sori. *Indusia* plane.

Fronds *pinnate, rarely simple; pinnæ entire, ovate-lanceolate, and acuminate.*

Species. 1. O. vittæformis, *J. Sm.* (Callipteris, *J. Sm.*) 2. O. ovatum, (*Wall.*) 3. O. alismæfolium, *Presl.* 4. O. elegans, *J. Sm.* *Illust. Presl, Reliq. Hænk. t.* 8. *f.* 3.

Obs. From an examination of specimens of *Diplazium ovatum* of Wallich, and *D. alismæfolium* of Presl, I originally considered them as not generically distinct from the following genus; but the recent possession of ample specimens of the above four species have now induced me to consider them as forming a distinct group, distinguished from the following by their entire and broader habit, as also by the fascicles of venules being nearly uniform and parallel, and not anastomosing till near the margin, as in the preceding genus, and differing from it only in the sori being binate.

Oxygonium ovatum and *alismæfolium,* have hitherto been observed and described as having only simple fronds; but I possess specimens with both simple and pinnate fronds growing from the same root, which, with many other like examples, shows the care necessary to be used in determining species from the examination of but few specimens.

76. CALLIPTERIS, *Bory, J. Sm.*

(Asplenii *sp. Sw. and Auth.* Diplazii *sp. Sw. and Auth.*
Anisogonium, *Presl.* ·Digrammaria, *Presl.*)

Veins costæform and pinnate, each opposite pair of *venules* angularly anastomosing, the superior ones usually free. *Sporangia* bilateral, constituting binate linear sori. *Indusium* plain.

Fronds *pinnate or bipinnatifid or bipinnate, often viviparous, smooth, the stipes and rachis sometimes aculeate.* Sori *usually decussate.*

Examp. 1. C. prolifera, *Bory.* 2. C. spinulosa, (*Blume*). 3. C. accidens, (*Blume.*) 4. C. Wallichii, *J. Sm.* (Asplenium ambiguum, *Wall.*) 5. C. Malabarica, (*Spreng.*) (Asplenium ambiguum, *Sw.*) *Illust. Hook. gen. fil. t.* 56. A. C.

Obs. The costæform pinnate venation is the principal distinction between this genus and the preceding, and which may be viewed as analogous to the venation of *Stegnogramma* and *Goniopteris*, in the tribe *Polypodieæ.* Some portion of the several forms of the large fronds of *Callipteris Malabarica* have often few or none of the venules anastomosing; in such case it is not generically distinct from *Diplazium.*

Presl has constituted a genus as belonging to this tribe, under the name of *Plenasium,* including two presumed species, which two species he originally described in *Reliquiæ Hænkeanæ*, as doubtful species of *Nephrodium*, viz., *N. Banksiæfolium* and *N. Bromeliæfolium.* He had not seen fertile specimens, and he quotes *Asplenium aureum* of Blume, and *Asplenium Grammitis* of Wallich, as the same as one of these species. Blume doubts his plant being an *Asplenium*, of which I have sterile specimens, as also sterile specimens from Presl of his two species of *Nephrodium*, which are the same as Blume's plant. What the *Asplenium Grammitis* of Wallich is I have not been able to determine, as I do not find it in the

Wallichian herbarium at the Linnæan Society. The genus therefore appeared to me a very doubtful one, but it is now explained by the possession of ample specimens brought from the Philippines by H. Cuming, Esq., which specimens clearly prove that *Nephrodium Banksiæfolium*, and *N. Bromeliæfolium* of Presl, and *Asplenium aureum* of Blume, are one and the same, and happen to be constituted from barren portions of the frond of *Osmunda Javanica !*

Tribe V. ASPIDIEÆ. *J. Sm.*

Sori round, rarely oblong, intramarginal, furnished with a special *indusium*, which is either *orbicular* and produced from the centre (*central*), or *reniform* or *cucullate*, and produced from the interior side of the sporangiferous receptacle (*lateral*), or sometimes attached wholly round the receptacle and including the sporangia, (*Calyciform.*)

Obs. This extensive tribe may be viewed as composed of species analogous in habit and vascular structure to those genera of the tribe *Polypodieæ*, which have round sori; but *Aspidieæ* differs by each sorus being furnished with a special indusium, which is often very fugacious, or so small as to become soon obliterated by the increasing size of the sporangia; and therefore in such cases it becomes difficult to determine in which tribe the species should be placed, and this can only be satisfactorily determined, by the examination of the sori in the early stage of their growth. From my own observation, it appears probable that there are many species described as belonging to *Polypodieæ*, that are true *Aspidieæ*. Therefore, setting aside the presence of the indusium as the only mark of distinction between the two tribes, the whole of *Aspidieæ* would naturally associate with *Polypodieæ;* but as the latter tribe is already extensive, it will be advisable to allow the presence of the indusium to characterize a separate tribe, consisting of genera whose differences are shown by the several modifications of venation, position of the sori, and form of the *indusium*, which latter organ is in the greater mass of the species either centrally or laterally attached. But these two characters are not always constant, for both modes of attachment are often found upon the same frond; consequently the form of the indusium is not to be wholly depended upon.

In at least four genera containing but few species, the indusium is attached all round the base of the receptacle, and include the sporangia, forming a more or less perfect cup, analogous to the tribe *Cyatheæ*, but wanting the elevated receptacle that particularly characterize that tribe; for the pedicillate sori of *Sphæropteris*, (which I place in *Aspidieæ*), cannot in my opinion be viewed as an elevated receptacle, even although the form of the indusia of the genera here alluded to would warrant their being placed in *Cyatheæ;* but on viewing their habit and characters in every other respect, I do not hesitate in placing them in this tribe. *Aspidieæ* contains probably above 200 described species, and is readily distinguished from *Asplenieæ* by the sori being round, with the indusium (when lateral, as in all *Asplenieæ*) attached across the venule, and not longitudinally in the direction of the venules as in *Asplenieæ*. From the following tribe *Dicksonieæ*, it is distinguished by the indusium of that tribe always conniving with the altered indusiiform margin.

SECT. I. SYMPLOPHLEBIEÆ.

Venation variously anastomose, or reticulated.

77. MATONIA, *R. Br.*

Veins forked; *venules* fertile anastomosing, sterile ones direct and free; *sporangia* definitely disposed in a simple series round a special receptacle, produced on the axes of confluence of numerous veinlets, furnished with an orbicular, inflated central attached *indusium*, constituting globose *sori*. "Rhizoma *creeping*, 6 *to* 8 *feet high*." Fronds *cordate-flabellate, multipartite, segments uniform, linear, equally pinnatifid, rigid, glaucous, from* 1 *to* 2 *feet in length, laciniæ about* 1 *inch in length, linear-lanceolate, obtuse, costate, lower venules anastomosing, forming* 2 *to* 7 *soriferous points parallel with the mid-*

rib; indusium *gibberous, its margin involute, usually including about six sporangia in the manner of an inverted cup;* ring *slightly oblique.*

Species. M. pectinata, *R. Br. Illust. Wall. Pl. As. Rar. Ic. t.* 16. *Hook. Gen. Fil. t.* 43.

Obs. This remarkable and unique fern is a native of Mount Ophir in the peninsula of Malacca, and all that was for many years known concerning it was, from a portion of a frond preserved in the Wallichian Herbarium of the Linnæan Society of London, from which Mr Brown characterized the genus; but through the indefatigable exertions of H. Cuming, Esq., botanists have now become possessed of noble specimens of this rare fern: it was found by him near the top of Mount Ophir in great plenty. The peculiarity in appearance and structure, in every respect of this fern, renders it difficult satisfactorily to determine its real affinities; in habit it may be compared with *Gleichinia*, and its relationship with that genus is partly borne out by the sporangia of each sorus being definite, and the ring being slightly oblique. The sori being produced on a central point formed on the confluence of from 5 to 10 venules, is analogous to the *Phymatodiæ* section of *Drynaria* in the tribe *Polypodieæ;* but the presence of a peltate central attached indusium induces me to place it in *Aspidieæ.*

78. HYPODERRIS, *R. Br.*

Veins costæform; *venules* compoundly anastomosing, producing from their sides variously directed, free sterile *veinlets,* which terminate within the areoles; *sporangia* produced on the angles or points of confluence of numerous veinlets, constituting round sori; *indusium* calyciform, membraneous, its margin irregularly laciniated and fimbriate.

Fronds *stipitate,* 1 *to* 2 *feet high, simple, entire, auriculated at the base, or* 3*-lobed, primary veins costæform, parallel, combined by transverse parallel venules, which again ramify and anastomose;* sori *irregular, or forming a row on each side of the primary veins;* indusium *very obscure.*

Species. H. Brownii, *J. Sm. Illust. Hook. et Bauer's Gen. Fil. t.* 1.

Obs. This genus is founded upon a solitary species, and is so similar in habit and venation, that without a close examination of its sori, it would pass for a species of *Drynaria*, allied to *D. plantaginea* and *D. sceptrum*, and only to be distinguished from that genus, as also from the following, by the sori being furnished with a very obscure but perfect calyciform indusium, similar in structure to that of *Woodsia*, but differing from that genus entirely in habit and venation. This fern is a native of Trinidad.

79. ASPIDIUM, *Sw. Schott. J. Sm.*

Veins costæform; *venules* compoundly anastomosing, producing from their sides, variously directed, free veinlets, which terminate within the areoles; *sporangia* produced on the angles or points of confluence of veinlets, constituting round sori; *indusium* usually orbicular and central, rarely reniform.

Fronds *from* 1 *to* 3 *feet or more in height, simple, or lobed, pinnate or bipinnate, margin entire, sinuated, or laciniated;* sori *arranged in a row on each side of the costæform veins, or primary anastomosing venules, or irregular, by confluence sometimes oblong.*

Examp. 1. A. Singaporianum, *Wall.* 2. A. trifoliatum, *Sw.* 3. A. macrophyllum, *Sw.* 4. A. alatum, *Wall.* 5. A. decurrens, *Presl.* 6. A. repandum, *Willd.* 7. A. polymorphum, *Wall. Illust. Schott. Gen. Fil. t.* 2. *Hook. et Bauer Gen. Fil. t.* 33.

Obs. This genus, as now restricted, contains species analogous in habit and venation to the *Dipteris* section of *Drynaria* in *Polypodieæ*, but distinguished by the presence of indusium which is usually orbicular; but instances of both orbicular and reniform indusia are often found on the same frond, and sometimes the latter are the most numerous; but as the species agree in habit, they therefore cannot be separated on the form of the indusia alone.

80. Sagenia, *Presl. J. Sm.*

(Aspidii sp. *Authors.*)

Veins forked; *venules* arcuately and angularly anastomosing, forming unequal areoles; *sporangia* produced on the angles or points of meeting of two or more venules, or on the apex of a free veinlet, terminating in the areoles, constituting round *sori; indusium* orbicular or reniform.

Fronds *pinnate, or bipinnate; pinnæ lobed or sinuously-pinnatifid;* sori *disposed in a row on each side of the ultimate midrib or irregular.*

Examp. 1. S. varia, (*Sw.*) 2. S. Hippocrepis, (*Sw.*) 3. S. apiifolia, (*Schk.*) 4. S. coadunatum, (*Wall.*) 5. S. platyphylla, *J. Sm.* 6. S. intermedia, *J. Sm. Illust. Hook. et Grev. Ic. Fil. t.* 202. *Schk. crypt. t.* 56. *b. Hook. Gen. Fil. t.* 53. A.

Obs. Sagenia differs but little in habit from *Aspidium*, and is distinguished as a genus principally by the absence of the irregular free veinlets which characterize the venation of *Aspidium.*

81. Pleocnemia, *Presl. J. Sm.*

(Polypodii sp. *Gaud.*)

Veins forked; the lower *venules* arcuately and angularly anastomosing, forming unequal areoles; the superior *venules* free and fertile; *sporangia* medial; *sori* round; *indusium* reniform.

"Rhizoma arboreus." Fronds 15 *to* 17 *feet high, bi-tripinnate, ultimate segments pinnatifid;* veins *of the laciniæ, forked; the superior* venules *soriferous, forming a row on each side of the midrib of the laciniæ.*

Species. P. Leuceana, *Presl.* (Polypodium, *Gaud.*) *Illust. Hook. Gen. Fil. t.* 97.

Obs. This genus is founded upon a solitary species, and differs from the preceding genus principally by its more gigantic habit, than in the character of the venation and sori, the sterile frond exhibiting venation similar to *Sagenia*, but on account of the ultimate laciniæ of the fertile frond being contracted, only the lower venules anastomose, the soriferous venules of the narrow laciniæ being free. Presl appears to have seen only the fertile state, and that without the indusium, which has, I apprehend, been the cause of his placing it in *Polypodieæ*.

82. ONOCLEA, *Linn.*

Veins (of sterile fronds) reticulate, fertile frond contracted, segments bacciform, constituting a universal *indusium;* fertile *venules* direct, free; *sporangia* medial, their pedicels concrete; *sori* round, 4—6 confluent; *special indusium* lateral, cucullate, very membraneous.

Fronds *of two forms, the sterile pinnate; pinnæ sinuous or pinnatifid;* fertile frond *bipinnate; pinnules contracted, sessile, their margin membraneous, conniving, forming a unilateral raceme of globous bacciform segments, each compactly filled with the sporangia of confluent sori.*

Species. O. sensibilis, *Linn. Illust. Schk. crypt. t.* 102, 103. *Hook. Gen. Fil. t.* 82.

Obs. On first viewing this singular but well-known fern, it may seem strange why it should now be placed in *Aspidieæ*, having been hitherto placed in affinity with *Blechnum* and *Woodwardia,* which has no doubt arisen by the membraneous conniving margin of the fertile segments having been considered as a true indusium, and from authors not having paid due regard to the apparent membraneous scales which are found interposed between the confluent sori, which membrane I find is cucullate, and attached on the sporangiferous receptacle analogous to the interiorly attached lateral indusia of many *Aspidieæ*. What further strengthens my opinion that *Onoclea* should be placed in *Aspidieæ* is, that the habit and venation of the sterile fronds are similar to the genus *Sagenia,* the fertile fronds of some species of that genus being somewhat contracted, and indeed only wanting a little more contraction to pass into *Onoclea.* Thus *Onoclea* presents the same affinity with *Aspidium* that *Struthiopteris* does with *Polypodium.*

Presl has constituted a genus (*Rhagiopteris*,) on two other presumed species of *Onoclea;* but it appears to me that there are no such species, and that the specimens upon which he characterized his genus have (by mistake,) consisted of the fertile frond of *Onoclea sensibilis* and the sterile frond of some other fern, an instance of which I have witnessed among Pursh's specimens of *Onoclea* in the herbarium of Mr Lambert.

83. CYRTOMIUM, *Presl.*

(Aspidii sp. *Sw. Wall.*)

Veins pinnate; the lower exterior *venule* free and fertile, the other angularly anastomosing, and producing on their exterior sides or angular junctions 1, 2, or 3 excurrent fertile free veinlets; *sporangia* medial; *sori* round; *indusium* orbicular, central.

Fronds *pinnate; pinnæ oblong-acuminate falcate, oblique or lobed at their base, margin entire or spinulous;* sori *numerous, transversely-multiserial.*

Species. 1. C. falcatum, (*Sw.*) 2. C. caryotideum, (*Wall.*) *Illust. Hook. et Grev. Ic. Fil. t.* 69. *Hook. Gen. Fil. t.* 49. *c.*

Obs. The two species constituting this genus approach in habit and texture the extensive genus *Polystichum* in the following section, none of the venules of which anastomose; and it is evident, on viewing the habit and venation of this and the two following genera, that they form a gradual transition to the free venation which characterize *Polystichum.* The character of *Cyrtomium*, as respects venation and position of the sori, is somewhat analogous to *Goniophlebium* and *Cyrtophlebium* in *Polypodieæ.*

84. PHANEROPHLEBIEÆ, *Presl. J. Sm.*

(Aspidii sp. *Schlecht.* Polypodii sp. *Humb.* Amblia, *Presl.*)

Veins pinnately-forked; the lower exterior or usually both the lower *venules* free and fertile, the superior ones angularly anastomosing and also fertile; *sporangia* medial; *sori* round; *indusium* orbicular, central.

Fronds *simple or pinnate; pinnæ linear-lanceolate, falcate, or elliptical, margin spinulous;* sori *arranged in* 2, 3, *or* 4 *transverse rows.*

Species. 1. P. nobilis, (*Schlecht.*) 2. P. juglandifolia, (*Humb.*) *Illust. Hook. Gen. Fil. t.* 49. A. (from Presl.)

Obs. The venules being less anastomosed is the chief distinction between this and the preceding genus.

85. FADYENIA, *Hook.*

(Aspidii sp. *Hook. et Grev.*)

Veins forked; *venules* anastomosing and reticulate, the lower exterior *venule* (of each fascicle) free and sporangiferous on its apex; *sori* round, transversely uniserial; *indusium* reniform, lateral.

Fronds *simple, entire,* 5 *to* 6 *inches long, the sterile lanceolate, attenuated, and proliferous at the apex; the fertile linear, attenuated towards its base, apex obtuse; the free venules in the sterile frond usually forked;* sori *situated in the costal areoles.*

Species. F. prolifera, *Hook. Illust. Hook. Gen. Fil. t.* 53. B. *Hook. et Grev. Ic. Fil. t.* 96.

Obs. The species upon which this genus is founded is a native of Jamaica, and as a genus it may be viewed as representing the same form of venation and position of the sori in *Aspidieæ* that *Goniophlebium* and *Synammia* does in *Polypodieæ.*

It is probable that *Fadyenia prolifera* is the simple form of a group to which may be referred the *Aspidium caducum* of Wallich, which is a large pinnate fern, the pinnæ being analogous in texture, venation, and position of the sori to the simple frond of *Fadyenia*, excepting that the venules become free towards the apex or superior half of the pinnæ; but as the specimens and figure (*Hook. et Grev. Ic. Fil. t.* 171.) which I have examined, are not perfect, having no evidence of its belonging to *Aspidieæ*, except by analogy, and its being so called by its original discoverer, (Wallich,) I therefore for the present hesitate deciding where it should be placed, and if, on further evidence, it should prove distinct, it may bear the name of *Hemigonium*.

86. Nephrodium, *Schott. Presl. J. Sm.*

(Aspidii sp. *Auth.* Cyclosorus, *Link.* Cyclodium, *Presl.*)

Veins costæform, pinnate; the lower pair or more pairs of *venules* angularly anastomosing and fertile, their junctions combined by an excurrent anastomosing sterile *veinlet; sporangia* medial; *sori* round; *indusium* reniform, rarely orbicular.

Fronds *simple, or pinnate; pinnæ entire, serrate, or sinuously pinnatifid; the superior* venules *of deeply pinnatifid pinnæ free, the lower pair always anastomosing;* sori *disposed in a row on each side of the costæform veins;* (costa of laciniæ) *sometimes becoming confluent, and forming a continuous line parallel with the margin;* sporangia *sometimes echinate.*

Examp. 1. N. multilineatum, (*Wall.*) 2. N. glandulosum, (*Blume.*) 3. N. confertum, (*Kaulf.*) 4. N. cyatheoides, (*Kaulf.*) 5. N. meniscioides, (*Willd.*) 6. N. gongylodes, (*Schk.*) (Cyclosorus, *Link.*) 7. N. unitum, *R. Br.* 8. N. aridum, *Don.* 9. N. deltoideum, (*Sw.*) 10. N. molle, (*Sw.*) 11. G. Blumei, *J. Sm.* (Gymnogramma canescens, *Blume.*) 12. N. canescens, (*Wall.*) *Illust. Schott. Gen. Fil. t.* 10. *Schk. crypt. t.* 34. b. *Hook. Gen. Fil. t.* 48. B.

Obs. Nephrodium is a name originally applied by Michaux to a few North American ferns, and has subsequently been adopted by Brown and others for an extensive group of great uniformity of habit, and distinguished from *Aspidium* by the indusium being reniform; but the genus is now restricted to a portion only of what has hitherto been included, and which are characterized by the venation being more or less anastomosed, leaving out the species in which the venules are all free, these being comprehended under the subsequent genus *Lastrea*, which with *Nephrodium* are exact prototypes of *Polypodium* and *Goniopteris;* therefore in the absence of the indusium there is no character whereby to distinguish them from these two genera. In a few the indusium is said to be orbicular. I have examined species so characterized, and have usually found it to be more or less approaching to, and even sometimes truly reniform; and it appears to me that due care has not at all times been taken by authors in their descriptions and figures of the indusium, and even supposing the indusium in a few cases to be orbicular yet I cannot admit the difference between reniform and orbicular, to be of sufficient importance as a generic distinction alone in this group of *Aspidieæ*. This view prevents me from adopting the genus *Cyclodium* of Presl, constituted upon three species characterized as having orbicular indusia.

87. MESOCHLÆNA, *R. Br.*

(Polypodii sp. *Wall.* Sphærostephanos, *J. Sm.*)

Veins costæform, pinnate; *venules* (the lower pair) angularly anastomosing, the others free; *sporangia* medial; *sori* oblong-linear; *indusium* linear, attached longitudinally on the middle of the sorus, its margins free and glandulous.

Fronds 2 *to* 3 *feet high, pinnate; pinnæ* 6—7 *inches long, linear-lanceolate, pinnatifid, villous;* venules *parallel;* sori *becoming confluent, the sides of the indusium then becoming vertical.*

Species. 1. M. Moluccana, *R. Br.* 2. M. javanica, *R. Br.* 3. M. asplenioides, *J. Sm.* (Sphærostephanos, *J. Sm.* Polypodium villosum, *Wall.*) *Illust. Hook. et Bauer Gen. Fil. t.* 24.

Obs. When I first characterized this genus in Hooker and Bauer's Genera Filicum, under the name of *Sphærostephanos*, I was not aware that it was the structure alluded to by Mr Brown in his observations on *Polypodium* in Horsfield's Flora Java. I also took a wrong view of the indusium, which was on account of my specimen being too far advanced. I viewed it as a peculiar kind of receptacle; but the examination of additional specimens have enabled me to see its true structure. The habits of the species are quite analogous to many species of *Nephrodium*, the linear sori being the only character that distinguishes it from that genus, the glandulous margin of the indusium being a character also common to many species of *Nephrodium.*

SECT. II. ORTHOPHLEBIEÆ.

Venation free, none of the venules anastomosing.

88. SPHÆROPTERIS, *Wall.*

(Peranema, *Don.*)

Veins costæform, pinnate; *venules* simple or forked, their apices clavate; *sporangiferous receptacle* medial, pedicillate! included within a globous calyciform *indusium*, opening vertically, sub-bivalved or irregular; *sori* round. "Rhizoma creeping." Fronds *stipitate tripinnate*, stipes *and* rachis *squamous;* laciniæ *obtuse, repand, each bearing* 1, 2, *or* 3 *sori;* venules *glanduliferous, their apex thickened.*

Species. S. barbata, *Wall.* (Peranema cyatheoides, *D. Don.*) *Illust. Wall. Pl. As. Rar. Ic. t.* 48. *Schott. Gen. Fil. t.* 4. *Hooker et Bauer Gen. Fil. t.* 22.

Obs. The very obvious and remarkable pedicel which elevates the sori considerably above the disk, readily distinguishes this genus from all other genera of *Polypodiaceæ.* The pedicillate sori of *Thyrsopteris,* and some species of *Trichomanes,* cannot be considered analogous to the pedicel or footstalk; in these it is merely formed by a prolongation of the veins beyond the margin of the frond, or by the contraction or absence of the usual cellular structure between the veins. A similar pedicel to that which characterizes this genus exists in a species of *Marattia,* which species I am disposed to view as constituting a genus under the name of *Eupodium,* and which is distinct from *Marattia* upon the same character that *Sphæropteris* is distinct from the following genus. I have at page 181 stated my reasons for placing *Sphæropteris* and the next genus *Diacalpe* in the tribe *Aspidieæ.*

89. DIACALPE, *Blume.*

Veins costæform, pinnate; *venules* simple, rarely forked, their apices clavate; *sporangiferous receptacle* sessile, superficial! included within a globous calyciform indusium, opening irregularly; *sori* round; *rhizoma* creeping; *fronds* decompound, multifid, stipes and rachis squamous-glandulous.

Species. D. aspidioides, *Blume. Illust. Hook. Gen. Fil. t.* 99.

Obs. This agrees in every respect with the preceding genus, differing only in the sori not being pedicillate: but although such appears to be the case, still they are not strictly so, being superficially seated on a slightly elevated point, from which the entire sorus can be freely removed without rupturing the base of the indusium or receptacle of the sporangia, a circumstance clearly proving its superficial attachment.

90. Woodsia, *R. Br.*

(Polypodii sp. *Auth.* Hymenocystis, *C. A. Meyer.* Physematium, *Kaulf.*)

Veins forked; *venules* simple; *sporangia* terminal or medial; *sori* round; *indusium* calcyciform, its apex open, nearly entire, or deeply laciniated, the laciniæ usually terminating in long hairs, which involve the sporangia.

Fronds *small, from* 1 *inch to a foot in height, bi-tripinnatifid, smooth or squamous;* veins *usually simple or forked, the lower exterior branch soriferous.*

Examp. 1. W. glabella, *R. Br.* 2. W. ilvensis, *R. Br.* 3. W. hyperborea, *R. Br.*. 4. W. Perriniana, *Hook.* 5. W. Caucasica, *J. Sm.* (Hymenocystis, *C. A. Meyer.*) 6. W. incisa, *Hook.* 7. W. mollis, *J. Sm.* (Physematium, *Kaulf.*) *Illust. Linn. Tran.* vol. ii. *t.* 2. *Hook. et Bauer Gen. Fil. t.* 3. *Hook. et Grev. Ic. Fil. t.* 68, 191. *Kunze Anal. Pterid. t.* 27.

Obs. This genus is characterized by its peculiar indusium, which in the original species of the genus (the cup or membrane) is very small, and soon becomes hidden by the enlargement of the sporangia; but the long hairs which fringe its margin remain conspicuous; in some other species the cup is more entire and complete, and in *Woodsia mollis* and *W. Caucasica*, the margin is nearly entire and circular, in that respect analogous to the genus *Cyathea*, but from which *Woodsia* differs in not having the elevated receptacle and compressed sporangia, which characterize *Cyathea*, besides being entirely different in habit, which is similar to the following genus.

91. CYSTOPTERIS, *Bernh. Presl. J. Sm.*

(Aspidii *sp. Sw.* Cyathea *sp. Smith.*)

Veins forked; ***venules*** free; ***sporangia*** medial; ***sori*** round; ***indusium*** lateral, oblong-reniform, inflated, cucullate.

Fronds *slender, bi-tripinatifid, from a few inches to* 1 *foot high, ultimate segments dentate or laciniated;* sori *usually becoming confluent, the free margin of the indusium dentate or fimbriate.*

Examp. 1. C. atomaria, (*Sw.*) 2. C. alpina, *Link,* 3. C. dentata, *Hook.* 4. C. fragilis, *Bernh.* 5. C. bulbifera, *Bernh.* 6. C. fumarioides, *Schott. Illust. Schott. Gen. Fil. t.* 8. *Schk. Crypt. t.* 54, 57, 62. *Hook. Gen. Fil. t.* 52. B.

Obs. The habit and inflated indusium of this genus indicates some affinity with the *Athyrium* section of *Asplenium;* but the attachment of the indusium being across, and not longitudinally on the side of the venule as in *Athyrium*, distinguishes them; and from *Woodsia* it is known by its lateral semicalyciform indusium.

92. LASTREA, *Bory, Presl., J. Sm.*

(Aspidii sp. *Auth.* Nephrodii sp. *Auth.* Polystichii sp. *Roth.* Dryopteris, *Schott.* Thelypteris, *Schott.* Arthobotrys, *Wall.* Hypodematium, *Kunze.* Polypodii, §. Lastreæ sp. *Bory.*)

Veins forked or costæform and pinnate; ***venules*** direct, free; ***sporangia*** medial or terminal; ***sori*** round; ***indusium*** reniform, lateral.

Fronds *varying from pinnate to decompound, the pinnæ or ultimate segments, entire, sinuous, or pinnatifid, fertile frond sometimes contracted, the lower exterior venule of forked veins, and usually all the venules of pinnate veins* *fertile*; sori *often confluent*; indusium *smooth or pilose, sometimes cochleate.*

Examp. 1. L. semicordata, (*Sw.*) 2. L. atrata, (*Wall.*) 3. L. falciculata, (*Radd.*) 4. L. chrysoloba, (*Link.*) 5. L. serra, (*Sw.*) 6. L. invisa, (*Sw.*) 7. L. appendiculata, (*Wall.*) 8. L. multijuga, (*Wall.*) 9. L. Sprengelii, (*Kaulf.*) 10. L. patens, (*Sw.*) 11. L. polyphylla, (*Kaulf.*) 12. L. novaboracense, (*Sw.*) 13. L. Thelypteris. (Thelypteris palustris, *Schott.*) 14. L. Oreopteris, (*Sw.*) 15. L. Filix-mas, (*Sw., Dryopteris, Schott.*) 16. L. elongata, (*Sw.*) 17. L. patentissima, (*Wall.*) 18. L. marginale, (*Sw.*) 19. L. venusta, (*Hew.*) 20. L. macrocarpa. (Arthobotrys, *Wall.*) 21. L. Goldiana, (*Hook. et Grev.*) 22. L. dilitata, (*Sw.*) 23. L. eriocarpa, (*Wall.* Hypodematium, *Kunze.*) 24. L. ascendens, (*Hew.*)

Illust. Hook. et Grev. Ic. Fil. t. 102. *Schk. Crypt. t.* 37, 38. *Hook. Gen. Fil. t.* 45. A.

Obs. This extensive genus presents nearly the same features as regards habit and venation to that which now characterizes the genus *Polypodium*; and, from my own observations, I am convinced that there are many species placed in *Polypodium*, which, if examined in an earlier state of growth, would prove to be furnished with an indusium, and to belong to this genus. In the numerous species of *Lastrea*, the indusium varies in texture and form, being more or less membraneous, plain or vaulted; but in my view not affording sufficient character for constituting genera, and like *Polypodium*, the position of the sori also varies in being medial or terminal; but which also affords no determinate character, and as the more or less regular pinnate or forked character of the venation depends upon the ultimate laciniæ or segments of the frond being more or less entire or laciniated, it therefore becomes difficult to arrange this numerous group of species otherwise, than by the circumscription of the frond.

In at least two species the fertile fronds are contracted and densely occupied by the sori, which state forms the genus *Arthobotrys* of Wallich; but this state of the frond appears in a great measure to depend upon local circumstances in connexion with its growth; for I possess specimens of fertile fronds scarcely or not at all contracted. Schott has proposed to form the *Aspidium* (Lastrea), *Thelypteris* of Swartz into a genus under the name of *Thelypteris*, as also *Aspidium* (Lastrea) *Filix-mas* of Swartz and its allies, under the name of *Dryopteris*—two genera in my opinion not at all tenable; for, allowing that there is some difference in the structure of the indusium of these species, and the fertile frond of *Thelypteris* being slightly contracted, with the margin revolute, yet I cannot be induced to adopt his genera; for, on viewing the whole of the species, they appear to form a gradual transition in habit and character from one to another, and even in habit, passing into the following genus, *Polystichum*.

The *Nephrodium hirsutum* of Don, (*Aspidium eriocarpum*, Wall.) has been characterized by Kunze as a distinct genus, under the name of *Hypodematium:* he separates it on account of its having, according to his view, pedicillate sori analogous to the genus *Sphæropteris*. Since I have seen his character and figure of the genus, I have again carefully examined the species; and from what I have seen, I must still continue to differ from that author in considering the sori to be pedicillate. The only peculiarity is in the receptacle being (as in all large sori,) more elevated than in the generality of *Aspidieæ;* but it certainly has no pedicel or footstalk, the sporangia being borne from its base to its apex: on removing the sorus, the force used will often tear away with it a small lengthened portion of the epidermis of the venule, which, viewed in certain positions, presents the appearance of a footstalk to the receptacle, as represented at *t.* 28, *fig. d.* of Kunze's *Analecta Pteridographica*.

The species of *Lastrea*, with bipinnatifid fronds, are so similar to *Nephrodium*, that the two genera can only be known from each other, by none of the venules of *Lastrea* being anastomosed.

93. POLYSTICHUM, *Roth.*, *Presl.*, *J. Sm.*

(Aspidii sp. *Sw.* and *Auth.* Hypopeltidis sp. *Mich.* Tectaria, *Cav.* Rumohra, *Radd.*)

Veins pinnately-forked; *venules* direct, free, the lower exterior one or more fertile; *sporangia* medial, rarely terminal; *sori* round; *indusium* orbicular, central, rarely eccentric and reniform.

Fronds *simple, pinnate, or bi-tripinnate;* pinnæ *usually auriculated at the base on the superior side, the margin usually serrate, the serratures or dents terminating in a rigid mucrone or spinule.*

Species. 1. P. glandulosum, (*Hook. et Grev.*) 2. P. rhizophyllum, (*Sw.*) 3. P. trapezoides, (*Sw.*) 4. P. falcinellum, (*Sw.*) 5. P. cæspitosum, (*Wall.*) 6. P. Lonchitis, *Roth.* 7. P. acrostichoides, (*Sw.*) 8. P. munitum, (*Kaulf.*) 9. P. lobatum, (*Sw.*) 10. P. angulare, *Kitab.* 11. P. vestitum, (*Sw.*) 12. P. proliferum, *R. Br.* 13. P. aculeatum, *Roth.* (*Sw.*) 14. P. platyphyllum, (*Willd.*) 15. P. coriaceum, (*Sw.*) Tectaria, *Cav.*, *Link.* Rumohra, *Radd.*) 16. P. aristatum, (*Sw.*) 17. P. hispidum, (*Sw.*) 18. P. speciosum, (*Don.*) 19. P. denticulatum, (*Sw.*) 20. P. coniifolium, (*Wall.*)

Illust. Schott. Gen. Fil. t. 9. *Hook. Gen. Fil. t.* 48. *C.*

Obs. This is also an extensive genus, and distinguished from *Lastrea* by its rigid and spinous habit; for, although the generality of the species have a truly orbicular indusium, yet there are many species, but especially those with decompound fronds, which have the attachment of the indusium eccentric, or even lateral; however, the dry rigid habit of these species clearly shows that they belong to the same group which have centrally attached indusia. The indusium in several species of this genus is remarkable in becoming hypocratiform, which takes place by the pressure of the sporangia underneath, raising the free circular margin of the indusium.

94. DIDYMOCHLÆNA, *Desv.*

(Aspidii sp. *Sw.* Tegularia, *Reinw.*)

Veins radiating, forked; *venules* direct, free, the exterior one fertile; *sporangia* terminal; *sori* elliptical; *indusium* oblong, central, and longitudinally attached.

Fronds *bipinnate; pinnules oblong, elliptical, truncate, oblique at the base, the midrib eccentric, vanishing towards the apex;* petiole *articulated with the rachis, apex of sterile venules, thickened and clavate.*

Species. D. truncatula, (*Sw.*) (D. sinuosa, *Desv.* Aspidium squamatum, *Willd.* Tegularia adiantifolia, *Reinw.*)

Illust. Hook. et Bauer Gen. Fil. t. 8.

Obs. This genus is founded upon a very fine, beautiful, and distinct fern, a native of Brazil, and the islands of Java and Luzon: its fronds are usually from two to five or six feet in length, and produced from a short arboreous caudex. It is the only genus in *Aspidieæ* besides *Mesochlæna*, that has elongated sori. It belongs to that peculiar group of ferns which have the pinnæ or ultimate segments of the fronds articulated with the rachis, and therefore deciduous as in some species of *Drynaria, Stenochlæna, Adiantum*, and some of the immediate following genera; and which structure is analogous to a similar articulation which forms the attachment between the base of the stipes and rhizoma of many ferns, especially those which have a creeping rhizoma producing the fronds in an alternate manner from the sides; and it is worthy of notice, that the whole of the species so characterized, have a great affinity in many other respects.

95. NEPHROLEPIS, *Schott.*

(Aspidii sp. *Sw.* and *Auth.* Nephrodii sp. *R. Br.* and *Auth.*)

Veins forked; *venules* direct, free, the lower exterior one fertile; *sporangia* terminal; *sori* round; *indusium* reniform, or sometimes nearly orbicular.

Fronds *pinnate, linear; pinnæ lanceolate, crenate, serrate or auriculate at the base; costæ sometimes slightly ec-*

centric; petiole *articulated with the rachis, apex of sterile venules, terminating in a round gland*; sori *forming a row parallel with, and near the margin.*

Examp. 1. N. pectinata, (*Willd.*) 2. N. exaltata, (*Sw.*) 3. N. tuberosa, (*Bory.*) 4. N. pendula, (*Radd.*) 5. N. obliterata, (*R. Br.*) 6. N. ensifolia, (*Sw.*) 7. N. punctulata, (*Sw.*) 8. N. acuminata, (*Willd.*) 9. N. splendens, (*Willd.*) 10. N. hirsutula, (*Sw.*) *Illust. Schott. Gen. Fil. t.* 3. *Hook. et Bauer Gen. Fil. t.* 35.

Obs. Although the habit of this group of species is very distinct from either *Lastrea* or *Polystichum*, yet the terminal sori and form of the indusium of *Nephrolepis* is also common to some species of these two genera; but the articulated petiole of *Nephrolepis* clearly indicates its being a distinct genus, and evidently forming the transition from *Aspidieæ* to the following tribe *Dicksonieæ*, through the genus *Humata.*

96. OLEANDRA, *Cav.*

(Aspidii sp. *Sw.* and *Auth.* Ophiopteris, *Reinw.* Neuronia, *Don.*)

Veins simple or forked; *venules* direct, parallel, their apices curved upwards, forming a slightly thickened margin; *sporangia* medial; *sori* round; *indusium* reniform, rarely orbicular.

Rhizoma *creeping or frutescent*; fronds *simple, entire, lanceolate, acuminate, smooth, or slightly villous, stipitate*; stipes *articulated near to or close to the rhizoma*; sori *transversely uniserial, and costal or irregular, usually produced on the exterior venule.*

Species. 1. O. neriiformis, *Cav.* (Ophiopteris verticillata, *Reinw.*) 2. O. Wallichii, *J. Sm.* (Aspidium, *Hook.* Neuronia asplenioides, *Don.*) 3. O. nodosa, (*Willd.*) 4. O. articulata, (*Sw.*)

Illust. Schk. Crypt. t. 27. *Hook. Ex. fl. t.* 5. *Hook. Gen. Fil. t.* 45. B.

Obs. The simple fronds with parallel veins terminating in a narrow margin distinguishes this genus from the preceding genera. *Oleandra neriiformis* is a very peculiar fern, differing from the rest of the genus by having what may be termed an erect frutescent branching rhizoma or caudex which is hollow, about half an inch in diameter, and rising to the height of from 4 to 6 feet, producing the simple fronds (which are about a foot in height,) in verticillate terminal tufts or lateral branches. It inhabits open situations, growing in groups.

III.—BOTANICAL INFORMATION.

BRAZILIAN COLLECTIONS.

M. P. Claussen is about to leave England for a further investigation of the Botany of the interior provinces of Brazil, and now invites subscribers to send their names and engagements to take sets of his prospective collections of dried plants.

The price has been fixed at £2 per 100 species, which will include all expenses of freight, charges, &c. &c.; so that they will be delivered in London at the small cost of £2 per hundred, without the addition of any extra expense whatever.

An inspection of P. Claussen's former Botanical collections, made during a residence and researches of many years in Brazil, is recommended to those Botanists who are disposed to take sets, that they may judge for themselves of his capabilities as a Botanical collector. As some proof of the value and extent of his former Brazilian herbaria, it may be sufficient to mention, that of the genus *Eriocaulon* alone, above forty species were included therein.

The payment for these collections will be only required on delivery of the respective portions, as they are transmitted from the collector, so that no risk whatever will be incurred by those who are willing to support the undertaking.

Mons. P. Claussen will, as much as possible, study to avoid the route pursued by former collectors, so that, as far as can be, an entirely different set of plants will be obtained.

The number of sets intended to be made up will be limited to twenty-five, so that early applications are requested. Still, it is but right to state, that of those twenty-five, three only are as yet engaged.

Subscribers' names received, and any further information gladly communicated by W. Pamplin, 9, Queen Street, Soho Square, London.

Information respecting MR GARDNER.

IT is with infinite pleasure we are able to announce the safe return to his native country, of the very enterprising and successful Brazilian traveller, Mr Gardner, with the continuation of his inestimable collections. The following are extracts from the letters that have lately been received from him:—

"ORGAN MOUNTAINS, 23*d March*, 1841.

"MY DEAR SIR,

"ABOUT six weeks ago I wrote you from Rio, stating that I had drawn on you for the sum of £200, and that it was my intention once more to visit the Organ Mountains. I have now the pleasure to inform you, that I arrived here about a month ago.

"For some time after my arrival I was not able to go out much, in consequence of a fall from my horse, which injured my back a little. I am now, however, quite recovered, and have lately been making excursions in the neighbourhood. As my main object in coming up was to make a collection of some of the fine shrubs and herbaceous plants, which are to be found principally on the higher levels of the Organ Mountains, to take home along with me in the living state, I got four large boxes made previous to my leaving Rio, somewhat on Mr Ward's plan, and left them in charge of my friend Mr Riedel, the Russian Botanical traveller in Brazil, till such time as I could send or take down plants to put into them. On the 9th of the present month, the weather appearing favourable for an excursion to the mountains, I started early in the morning, accompanied by a young friend from the city, who had come up to join me. On the first day we reached the highest point to which I had formerly ascended, and then we took up our quarters beneath the ledge of a rock, and we continued to make use of it as a sleeping place for the three following nights. During the four days which we remained there, we made excursions in all directions; and I have been richly rewarded by the discovery of many fine things, both for the herbarium, and to take home with me alive. The highest summits I take to be 6857 feet above the level of the sea, and on it I found another fine new species of *Prepusa,* not so large as my *P. connata,* but still a most beautiful plant. I am anxious that it should bear your name, and have consequently called it *Prepusa Hookeriana.* I have drawn up a description of it, and a young lady, who is residing here at present, has made me a fine drawing of it, both of which shall be sent to you by an early opportunity. I have fine plants both of it and *P. connata,* to take home alive with me, and as they seem to be very tenacious of life, I have but little doubt of my being able to put them into Mr Murray's hands for cultivation. I also found a beautiful *Escallonia,* 3 sp. of *Hypericum,* a *Lychnophora,* a *Vellozia,* a *Barbacenia,* a *Rhopala,* and a host of other plants, different from those which I picked up on my former trips—all of which I hope soon to have the pleasure of showing you personally. Two days after I returned from this excursion, I went down to Rio myself with my collection of living plants, and had them planted. They filled three of the boxes, and as there are still many plants here which I should like to introduce, I have ordered other two to be made. I have secured two fine plants of the *Luxemburgia,* of which I formerly sent home only a single specimen. I have also found fine specimens of it in fruit.

" Previous to my leaving Rio, I arranged and packed up all my collection of specimens from the province of Goyaz, amounting in all to 1402 species, and left them with Messrs Harrison's people, to be sent to London by the first opportunity. None, however, occurred, till I went down to Rio myself, when I found a ship just about to sail, and was fortunate enough to get them put on board. My collections from Minas, and from this province, I shall take home along with myself. In the course of a month or so I expect to get a ship to take me to Liverpool : if not then, I must go home in a vessel bound for London. I would much prefer an opportunity for the former place, on account of my cases of living plants.

"To-morrow I start on an excursion of eight or ten days towards the banks of the Parahiba, in the hopes of meeting with some *Orchideæ*, which must there be very different from those which grow on the mountains. For some time past I have been expecting letters from you, and my other friends, but I now begin to imagine that I need expect no more, on account of your thinking that I am by this time on my way home.

"GEORGE GARDNER."

RIO DE JANEIRO, *5th May*, 1841.

"MY DEAR SIR,

"IT is now about a fortnight since I had the great pleasure of receiving your kind letter of 18th January. I returned from the Organ Mountains about ten days ago, bringing with me a splendid collection of living plants principally from the upper ranges. Among them I may mention *Luxemburgia ciliata*, *Franciscea hydrangeæformis*, *Prepusa connata*, *Prepusa Hookeriana*, which is a great beauty, and I have an abundant supply of both dried specimens and living plants, two species of *Fuschia*, a *Bougainvillæa*, *Lavoisiera imbricata*, a beautiful *Escallonia*, from the summit of the mountain, some fine *Lobelias*, and *Gesneriaceæ* belonging to several of the new genera of Martius; *Euterpe edulis*, Mart., which is the *Cabbage Palm* of Brazil, some half-dozen species of *Salvia*, a fine herbaceous *Composita* belonging to *Mutisieæ*, (about six feet high, with orange-coloured flowers, not unlike those of *Stiftia*, two species of *Virgularia*, two of *Gaultheria*, *Viola balsaminoides*, *Baccharis platipoda*, several fine *Begonias*, a few *Ferns*, two beautiful species of *Alstrœmeria*, &c., &c. Of these I have six large cases now on board, and the plants seem nearly all to be reconciled to their situation. A *Vellozia*, (not *candida*), a *Hillia*, a *Buena*, a *Campomanesia*, and two fine species of *Echites* are also in the collection. I wrote you shortly after my first journey up to the summit of the Organ chain, and told you I was going on to the Rio Parahiba. I have now to inform you that I spent a fortnight in that excursion, and have added not a few species to my collections, as well of living as of dried plants. I found some fine *Orchideæ*. Of these I take home with me five cases packed in husks of Indian corn. I have fortunately found a ship to convey me to Liverpool, but she must call at Maranham, to take in a cargo of cotton, and it is likely that we may remain there some three weeks; this, however, I shall not regret, as I may possibly find something new, or at least, different from what I have already found. My traps are all on board, and I embark myself in the course of a few hours, as the ship will sail early to-morrow morning. The captain expects to be able to reach Liverpool about the end of July. I have to-day taken the liberty of drawing upon you in favour of Messrs Harrisons and Latham of Liverpool for the sum of £96. 2s. 3d. sterling, which I trust you will be so kind as to honour. This clears all my expenses up to Liverpool. Even before I received your letter I had made a collection of the more common sea-weeds of this coast. They are, however, very rare. Hoping soon to have the very great pleasure of seeing you personally, &c.

" GEORGE GARDNER."

" CITY OF MARANHAM, 22*d May*, 1841.

" MY DEAR SIR,

" A VESSEL which leaves this place for Liverpool to-morrow morning, allows me an opportunity of sending you this hurried epistle. On the morning of the 6th instant, I left Rio de Janeiro in the ship 'Gipsey,' bound to this port, where she loads cotton, and thence to Liverpool. We had a very pleasant and expeditious voyage, being only fifteen days at sea. Upon the whole my living plants are standing very well; but some of the finest ones from the top of the Organ Mountains are dead. The *Luxemburgia*, however, and the two *Prepusas*, a *Vellozia*, two *Fuschias*, &c., &c., are still alive and likely to do well. As we only arrived yesterday morning, I can give you but little information respecting this place, further than that it is very flat, and covered with low wooded vegetation, among which I observe a great quantity of a species of *Attalea*. I find myself very well known here—they having heard of me when I was up at Oeiras. I brought letters to some of the first merchants, and I have taken up my quarters by special request, at the house of the Doctor here, who is a Scotchman, and pupil of your friend Dr Graham of Edinburgh. This is the season of the rains here, but notwithstanding, I intend to go a little into the country, and I have no doubt that I may be enabled to add a few things new to my previous collections. It is said, that we shall remain here a fortnight, but certainly not more than three weeks. To-day, I saw a large party of my old friends, the rebels, brought down prisoners from the interior, and a precious-looking set of scoundrels they are. All is now quiet about Oeiras and Caxias, and the cotton trade is resuming its wonted activity. As the ship by which this goes is a bad sailer, and ours a very good one, perhaps I may be in Liverpool immediately on the heels of it.

"GEORGE GARDNER."

"SHIP 'GIPSEY,' on the passage from
"MARANHAM to LIVERPOOL, *6th July*, 1841.

"MY DEAR SIR,

"ERE this can fall into your hands, I have no doubt of your having heard of my departure from Rio de Janeiro.

Just before embarking, I wrote you a few lines to go by the packet which sailed on the same day that we did. On our arriving at Maranham, another opportunity presented itself, and I did myself the pleasure of addressing a few lines to you, to let you know that I had reached that place in safety; but as the vessel in which it went was in very bad trim for sailing, I doubt much if that letter reached you any sooner than this one. We were only detained nineteen days at Maranham, there being a cargo of cotton ready for the ship on our arrival. Our stay there was during the heaviest season of the rains, and on this account I was prevented from going out to botanize so often as I could have wished. I nevertheless made several excursions through the island, and spent three days in the neighbourhood of the town of Alcantara, which is on the main land, and have thereby added considerably to my herbarium. The country is very flat, even flatter than it is at Pernambuco, and the soil is very sandy and arid. Besides my species which I had formerly collected in other provinces, I may mention the following which were new to me:—A *Taligalea*, different from the two which I found in the province of Goyaz, *Isertia coccinea*, a *Lisianthus*, *Quassia amara*, *Allamanda cathartica*, a climbing fruticose *Echites* with white flowers, *Dodonæa viscosa*, an *Ionidium* with white flowers from the seashore, *an Ambrosia* from the same place, a *Salicornia*, *&c.*, *&c.* I also found abundance of your *Parkeria*, having thus proved its existence in this province, as well as in that of Pernambuco, Goyaz, and Rio de Janeiro. I have likewise again found on the sandy shores *Mouriria Guianensis.* My Maranham collection has dried pretty well, notwithstanding that the greater part of it has been dried on board ship. The six boxes of living plants which I brought with me from the Organ Mountains have not done so well as I could have expected—out of about 150 species, not more than 50 are now alive. Many fine things have perished, but there still remains much that Mr Murray will be proud of. *Franciscea hydrangeæformis* looks well—there are two plants of it. *Prepusa connata* is in excellent health, and shooting up flowering stems. *Prepusa Hookeriana* does not look so well, but I think there is no danger of it reaching Glasgow alive. Of the palms, *Diplothemium maritimum*, *Euterpe edulis*, and *Corypha cerifera* are alive. I am afraid that the beautiful *Luxemburgia* is gone, as also the *Velozia*. I have done all I can to save them, yet it is annoying to see so many blanks. The hot moist dull weather at Maranham killed a great many of them. On our voyage we passed close to Pernambuco, but we did not call. I should liked to have done so to see my old friends there, particularly Adamson. At Maranham I saw two Oeiras acquaintances—one of them a son of the old Baron of Paranahiba. The rebellion has at last been put down, and the province is once more getting into a settled state. The authorities are catching all those who were engaged in the insurrection, and sending them to the province of Rio Grande do sul to fight against the rebels there, which is rare policy.

" As we expect to make land in the course of about three days, I have taken the liberty of addressing these few lines to you, to be ready for the postoffice on my arrival at Liverpool. It is very probable that I may be detained there for a day or two on account of my numerous packages. The nearer I approach home I find that I feel the more anxious to be among my friends again. Intermingled with those feelings, I find those of regret springing up also, at my having left such a beautiful country as Brazil ; for, notwithstanding the many privations to which my long journeyings gave rise, I must acknowledge, that during my stay in it, I have enjoyed a greater share of health and happiness than I have done during any former period of my life. In admitting this I do not forget that I am entirely indebted to you for being enabled to undertake and accomplish all that I have done ; and I hope now very soon to be able to return you my most sincere and grateful acknowledgments *viva voce*."

"MERSEY HOTEL, LIVERPOOL,
"11*th July*, 1841.

"I AM happy to inform you that I have at last safely arrived here. We made land on Thursday (8th) evening, and reached the mouth of the Mersey yesterday afternoon about five o'clock, but had to lie to till three o'clock this morning for want of water, during which time we experienced a terrible gale from the N.N.W. It began to calm about three o'clock, and the tide then beginning to flow, we stood up the river, and anchored opposite the docks about six o'clock, A.M. The vessel may perhaps get into dock to-morrow. In the mean time, I start for Manchester, to see our friend, Mr Bowman, and shall return to-morrow forenoon. I find that there are steamers to Glasgow every day, and it is possible that I shall get away on Wednesday afternoon. I find the weather awfully cold. It seems as if it were winter.

"GEORGE GARDNER."

Repertorium Botanices Specialis.

DR G. WALPERS of Berlin announces his intention of publishing, under the above title, a work which cannot fail to be acceptable to all students of botany, and which, "comprising the newer productions of botanical literature, shall give a survey of all the species of plants which have been described since the appearance of De Candolle's *Prodromus*, Wildenow's *Species Plantarum*, and the similar productions of Sprengel, and Rœmer, and Schultz. Certainly every friend and lover of botany has already felt the desire, as the number of works in his branch of science has daily increased, to possess a book that might afford him accurate information where this or that genus or species has been described, and what new works have appeared since the publication of those just mentioned, and which are still unfurnished. To satisfy this laudable curiosity is the object of the *Repertorium* here announced, which will exactly correspond with Endlicher's admirable *Genera Plantarum*, both in external form, and in interior arrangement.

"Many of the most distinguished botanists of Germany, as for example, Messrs Endlicher, Link, Kunth, Hornschurch, Bauer, Nees von Esenbeck, and Klotzsch, have had the goodness to promise their assistance to the work, and have partly undertaken the elaboration of particular families. Other able colaborators are confidently expected; and, supported by such aids, and by ready access to extensive libraries, Dr Walpers is warranted in believing he shall produce a very useful work. He wishes it to be understood, however, that all the plants described in the above works will not be received, but under the species those works will be quoted. All the newer species will be designated in such a manner, that their synonymy, their native country, and the complete citation of the work where it is described, will be given. If the works referred to are very rare, or expensive, or not to be procured in the book-trade, as for example, *Boissier's Elenchus*, the diagnosis will be given in short but intelligible characters. All the useful figures known to the author will be quoted.

"Dr Walpers earnestly solicits communications of books or information that may assist him in this laborious undertaking."

PROSPECTUS.

INDUCED by the advantageous offers which a Swiss colonist, long settled in the island of Java, has engaged himself to fulfil, the subscriber has decided on visiting and exploring the rich natural productions of that fine country. It is his intention on arriving at Batavia to proceed immediately to the residence of his countrymen, thirteen leagues distant from the coast, and there to remain for several years. After exploring the vicinity of this plantation, he will diverge to greater distances, and thus acquire a knowledge of the whole country, it being his object to penetrate the least visited districts, and even to climb its lofty summits, hitherto untrodden by any European Naturalist. The plan of residing at the place in question is selected, because it is in a central situation, and near the uncultivated districts, having also the recommendation of being very healthy, a precaution not to be neglected by any traveller, even when possessed of an excellent constitution, and at the most favourable period of life.

The individual who contemplates this journey intends to prepare collections of dried plants, seeds, bulbs, and Orchideæ; also sets of minerals and geological specimens; the skin, skeletons, and particular organs of Mammiferæ, birds, reptiles, fishes, Molluscæ, shells, insects, and radiated animals; devoting the utmost care to the selection and preparation and despatch of such collections.

With a view to obtain the requisite means for making the journey, and accelerating the needful measures, the subscriber herewith states the terms on which the various objects will be furnished, as follows:—

1. Each subscription shall cost 200 French francs, payable in the present month of July, or at latest in August, and be sent either in money or in bills of credit.

2. The individual who shall have received the full value of the share which he has contributed, is to promise that if the proceeds have been satisfactory to him, he shall take another share of equal value as the first.

3. The animals, vegetables, and minerals, shall be valued at the current price of the class to which they belong—nothing being added for the expense of carriage to the place of distribution.

4. The subscribers will be entitled to 20 per cent. premium on shares taken from the very commencement of the enterprise, and 10 per cent. on all future ones; and their specimens will be sent to them before any person whatever is allowed to purchase.

The traveller has made arrangements with an individual well versed in science, Professor Moritzi, Professor of Natural

History at Soleure in Switzerland, who undertakes to receive and distribute the collections, numbering the different specimens, and despatching them throughout Europe, so that all transactions and communications will pass through his hands.

It is the intention of the subscriber to insure his life for a sum at least equal to the money advanced to him, provided this can be accomplished at a not exorbitant rate; thus, if he should die, the proceeds of the insurance will be applied towards remunerating the shares for the whole or such portion of their subscriptions as shall not have been paid in objects of natural history.

The naturalists, who shall receive this prospectus, and who feel an interest in the enterprise, are requested to state, as early as possible, the amount of their contributions, and the particular nature of the specimens in which they desire to be paid. The money can be sent, either to the subscriber, to Messrs Passarant and Co., at Bâle, or they can point out the house of any Banker with whom they may prefer to deposit it.

They are farther requested to impart this prospectus to any individuals who may be likely to feel an interest in the projected journey.

HENRY ZOLLINGER.

HERZOGENBUCHSEE,
Canton of Berne in Switzerland,
25*th June*, 1841.

Our readers will feel the value of such a testimony as that of Professor Alphonse De Candolle of Geneva, who is well acquainted with M. Zollinger, who, in addition to the printed assurance appended to M. Zollinger's prospectus, states, in a letter to ourselves, that he feels perfect confidence in the character of the individual in question, whom he knows to be a man of upright principles, and calm, persevering, active disposition. His principal taste is for botany, but he possesses a knowledge of other branches of natural history; and on the whole, M. De Candolle thinks that the prospect of success is unusually bright in the projected enterprise.

Extracts from the Brazilian Travels of Drs Spix and Martius.

Our readers, especially those who feel an interest in the extensive collections recently made by Mr Gardner in Piauhy, will read with pleasure the following narrative of the distinguished Bavarian travellers, Drs Spix and Martius, which, as far as we know, has not yet appeared in an English dress.

Journey from Joazeiro, through part of the Province of Pernambuco, to Oeiras the Capital of Piauhy.

On the 21st of April, we crossed the Rio San Francisco in a large ferryboat, which traverses the stream on ropes, and entered the province of Pernambuco at the *Registo do Joazeiro.* This passage of the river is the most frequented and important, in the whole Sertao of Bahia; the entire commercial intercourse of the country is thus prosecuted between this district and Piauhy; Maranhao, Goyaz and Matto Grosso, are also supplied by the same channel. The chief articles of freight are slaughtered cattle for Bahia, and European goods. In later times, since the diminution of the direct slave trade between the northern coast of Africa and the provinces of Para, Maranhao, and Pernambuco, it has been customary to carry the slaves over the Rio San Francisco by this passage to the plantations of Maranhao. But though this intercourse has been but too actively prosecuted, government has gained little revenue from it. The number of slaughtered cattle, too, has fallen off; formerly the annual number amounted to fifty or sixty thousand head; now to twenty thousand. Government has farmed the income of this ferry to the highest bidder, and a family in Pernambuco now pays the sum of five to six hundred thousand réis yearly, and collects the toll. The rate of charge is 100 *réis* for a fresh negro slave (*Negro novo*); each head of cattle and young untamed horse cost 80 réis to carry across the river; but a horse properly broken, being much more valuable, pays 320 réis.

At this passage, do Joazeiro, two roads from Piauhy meet, and are called the *Travessia nova;* these lead, at various distances from the Rio San Francisco, up to the sources of the river Calinde, and then, following the course of the latter, descend to Oeiras. A third road, commencing at the little village of Sotrado on the river, follows the devious windings of the Rio Piauhy; this is termed the *Travessia Velha.* We now pursued the former track, and to our sorrow found a great scarcity of water; a common misfortune in this country during the dry season, which lasts from August to December. The whole Sertao that here stretches itself between the western tributaries of the Rio San Francisco and the source of the Rio Pontal, is cursed with a hot and dry climate, drying up annually the few brooks that intersect it. The individual *Fazendeiros,* who have settled themselves in this country, supply their own wants by means of cisterns, in the advantages of which the thirsty travellers generally partake. Still, it is often the case, that half the oxen and horses, driven across this tract from Piauhy, perish from drought before reaching the Rio San Francisco.

After leaving the *Registo do Joazeiro,* and its hospitable inhabitants, we struck out of the high road towards Melanzias; because much rain had lately fallen there, and the extensive meadows around were clothed with delightful verdure. We slept in the open air, slinging our mats to the trees in the *Catinga* forest, and enjoyed sweet repose; the flowery bushes breathing a delicious perfume, and the budding spring giving us a pleasing anticipation of the success which should attend our journey through Piauhy to the desired Maranhao. Who could have thought of the perils and disastrous events which awaited us?

During the night, our mules strayed far and wide, and in the morning we found that the straps for their feet had been stolen. This was the first and last case of such robbery which we met with; for, though in Brazil such conduct is not visited, as elsewhere, with the deprivation of the offender's ears, yet the Brazilians, in general, respect the traveller, and do not thus expose him to the danger of losing his mules. The further we diverged from the course of the river next day, the more uneven did the face of the country become. It was everywhere intersected with ditches, which, communicating with the river, are designed for the purposes of irrigation, and being now filled with rain-water, and of great length, proved great hinderances to our progress. More than once, we were obliged to cross these ditches, at the risk of soaking our packages. Their banks, and often their channels, are full of the same vegetation as prevails on the shores of the Rio San Francisco; prickly trees, strong thick climbing plants and the *Algadisso*. Where the view opened sufficiently to show us the meadows, we were charmed with the rich and even verdure of their grassy carpet. The inhabitants call these tracts *Campos Mimosos*, and cut the smooth soft stalks which abound in them for the use of their numerous herds of cattle. Here we first entered those districts which are devoted to the rearing of cattle, and which may be appropriately termed the Switzerland of Brazil. Whereever we took up our lodging for the night, the people brought us milk of rich and excellent flavour, and possessing the same good qualities as in the more southern districts; for it is only in times of extreme drought, that it ever becomes thin, gummy and blue. A cow gives from three to four measures of milk, which is only drawn once in twenty-four hours, and in the morning. Butter, which is good, is never made, except in the first month of the rains, here called the green (*verde*) season.

The generous animal diet, together with the employments of the *Sertanejos* in this and the more northern districts, exert a powerful influence on their character and constitution. A gay, openhearted, expression of countenance is quite remarkable in the round happy faces of those well-fed, strong and laborious people. Their business of keeping the herds of cattle together, protecting them from the wild animals, catching them when required, &c., inures their bodies to much fatigue and great endurance, so that the traveller is surprised to see, amid these sultry tropical regions, a race of men possessing the firmness and the activity of the inhabitants of the north. Doubtless, the perpetual round of such occupations does tend to tranquillize the mind, perhaps to deaden some of its imaginative properties; and thus the simple inhabitant of Piauhy, in his calm and prosaic disposition, is a widely different being from his refined, poetic, and delicate neighbour, the *Mineiro*.

After we had partaken of excellent fare at *Terra Nova*, a farm belonging to the Commandant of Joazeiro, who received us with great kindness, we travelled for some leagues over verdant meadows, to the *Fazenda do Boin Jardin*, and quartered for the night near a large pond. A number of bull-frogs filled the air with croakings which resembled the sound of a kettledrum, and far from testifying any dread or dislike of the light, they gathered round the fire in large troops, annoying us with their disgusting appearance, and adding to the restlessness which was occasioned by millions of mosquitoes, whose venomous bites prevented our sleeping the whole night. The three following days, during which we proceeded from the *Fazenda Amargosa* to that of *Anjico*, passing several others on the way, presented nothing worthy of note. During the first of these days we met with the dry channels of several little brooks, which during the rains fall into the Rio Pontal; but we soon reached a tract, destitute of water, and covered either with meadows or *Catinga Forests*, just about to put forth their foliage. The mountain formation is universally granitic, sometimes passing into gneiss and micaceous slate, without any visible layers. On the latter substance, of which the surface was frequently crumbled into a fine white sand, we noticed delicate forms of flowers and bright green grasses, reminding us of the vegetation that prevails in the country of Minas.

The road rises imperceptibly; and though we here arrived at the district where those two powerful rivers, the Rio San Francisco, and the Rio Parnahyba take their source, and whence they diverge and proceed on their separate course, yet we saw no extensive and lofty range of mountains. When emerging, however, from the *Catinga* forests, between the *Fazendas Anjico* and *Capoculo*, we observed a low hill before us, called by the natives the *Serra dos dois Irmaos*, running from south to west, with gently rising sides, here and there intersected by low furrows, and its declivities covered with shrubs and herbaceous plants. Large antediluvian bones are said to exist in a pond near the *Fazenda of Capoculo*, and its owner assured me, that in one place, a huge head with two large tusks might be seen projecting half above the ground; but as the spot was now covered with water, I could not myself examine into the truth of this statement.

The road now continued to rise towards the *Serra dos dois Irmaos*, and when we had left the little *Fazenda do Barreira* behind us, we came to a lower part of the range of hills, and saw the pass, sixty feet wide, which affords access to the province of Piauhy. There is nothing picturesque in the scenery; the two hills are of uniform appearance, and very moderate elevation: our barometrical observations gave a height of 1250 Parisian feet.

The *Serra dos dois Irmaos*, which we crossed, is a portion of the widely extended mountain range, which, for at least five degrees of latitude, divides the province of Piauhy from the eastern provinces of Pernambuco and Ceará, and intersects most part of the continent of Brazil. The accounts of this range are extremely various and undefined, chiefly owing to the different names which its individual parts bear. Most of the Portuguese charts assign the appellation of *Serra Ibiapaba* to the central portion, although this word signifies "end of the country." By the *Sertanejos* of Pernambuco and Parahyba, again, the part of the range which forms the boundary between Ceará and Rio Norte, is called *Serra Borborema.* Numerous mountains, of lower elevation, branch off east and west from the principal chain; the rivers, which distribute water to the provinces around, here take their rise, and some of them are abundant in gold. The general structure of these mountains is granite, and they attain their greatest elevation between the 6th and 7th degree of latitude. The hills which branch off from this great *Serra* are mostly covered with wood; and the intervening lowlands, with rough, stout grasses and bushes. From the great heat and general want of water, the woody districts are the most susceptible of cultivation. In this hilly country, however, the sky is by no means so cloudless and glaring, nor the weather so settled, as on the plain; and towards the western slope of the mountains, more rain and dew fall than on their easterly sides. The rainy season begins in January, and lasts till April here; while in the southern provinces, near the sea, it commences in September. During its continuance, everything becomes verdant, and flowers appear in profuse abundance; but from August to December, the heat and drought reduce the whole country to a dead and barren plain. This state of climate, and its accompanying consequences on the country, extend from Ceará to the northern half of the province of Piauhy. The *Sertanejos* give both to this vegetation and climate, the term *Agreste ;* in contradistinction to the vegetation which they call *Mimosa,* a name which they (singularly, to our ideas,) apply to the climate also. The custom of bestowing the same appellation on *cause and effect,* is remarkable, and shows the faculty of observation with which the *Sertanejos* are endowed. Both the *Agreste* and *Mimosa districts* are liable to suffer, perhaps once in ten or twelve years, when there has been a scanty rainy season, or none at all, from excessive drought; the earth then rends into deep chasms; vegetation is utterly destroyed; the wild animals of the forest, and the numerous herds which belong to the natives, alike perish; and the inhabitants are driven by hunger and thirst, to emigrate. In the year 1792, a drought commenced in the province of Ceará, that lasted till 1796, and annihilated all the domestic animals and many of the people. For a long time honey was the only article of food; and, as might be expected, numerous diseases followed the use of it, and swept off thousands of poor creatures; while from seven parishes the whole population emigrated, leaving not even a single individual behind. If the reader is inclined to question the accuracy of these statements, as proceeding from an individual who saw a comparatively small portion of the country whose general features he has thus sketched, I may mention that much of my information was derived from the *Vagueiros* or herdsmen, who drive the cattle from Piauhy to the capital of Pernambuco, and who travel through various parts of the country. I am much indebted to the observations which were kindly communicated to me by Captain Mattias J. da Silva Pereira, who is an architect at Oeiras, and who, in his journeys in almost every district of these provinces, has acquired great knowledge of their geographical features.

The *Serra dos dois Irmaos* consists of a solid, whitish, coarse-grained granite, in which mica commonly appears in silvery-white large laminæ, and mingled with layers of a blackish-grey, and greyish-blue colour. As we proceeded onward, we had hoped to see a very marked change of vegetation; but our expectations were not fulfilled, though we noticed an alteration in the geological features of the country, and observed in many places a strong clayey earth, frequently of a brick-red colour, looking as if it had been burnt, and mixed with fragments of quartz. These lumps of earth were like stones; and, when broken, appeared cloudy-coloured, and full of holes. Our guide assured us, that such stones, which are called at Goyaz *Batatas*, were there considered as undoubted indications of the existence of gold; and, that even here, this metal, although in small quantities, is still occasionally washed up.

Behind the ridge of *dois Irmaos*, we saw another hill, apparently belonging to the same range, and we skirted it, in order to descend lower down the *Catingas* to the *Fazenda Serrinha*, where we bivouacked beneath a large and densely foliaged Joa-tree. We had just gone cheerfully to rest, when distant thunder awakened us; and instead of the bright firmament, glittering with the lustre of unnumbered stars, which had, as it were, lighted us to bed, we found ourselves enveloped in the thickest darkness. The occasional flashes of lightning revealed the agitation of the sky, and illuminated the margins of the gloomy clouds, when, all at once, a most vehement storm rushed down on the forest and threatened to uproot all the trees and bushes with its truly tropical fury. The earth shook beneath us from the force of the hurricane, and the thick trunks of the primitive forest crashed and fell, or were uprooted by the wind; added to which, the piercing shrieks of the apes and the cries of the flocks of birds, whose frail dwellings were driven about their ears, filled us with terror and alarm. A violent gust of wind, tearing off the roof from an adjacent house, flung it on a low shed, which having been used as a kitchen, contained a fire, which presently ignited the whole mass, and by its blaze illuminated the whole disastrous scene. We had not forgotten our packages, but all our plans for their security were frustrated by the suddenness and violence of the storm. Accident, however, favoured us; the hospitable *Joa-tree*, beneath whose boughs we had encamped, was uprooted, and its umbrageous summit so sheltered our goods, that next morning, we were enabled to extricate them almost uninjured. The rain had a very disastrous influence on the health of our servants, giving them heavy colds, and causing a return of the ague with which they had previously been afflicted.

Northward from Serrinka, rises the mountain, called the *Topa;* its direction is mainly east and west, and it lies in successive terraces of white or pale-reddish chalky freestone. We left this attractive ridge to our right, and entered an extensive elevated plain of which the vegetation was peculiarly pleasing, from the dense *Catinga bushes*, which gradually give place to open plains. Fine *grass* of various kinds, with flowering *Mimosa* in different species, and bushes of *Acacia*, *Bauhinia*, *Combretum*, and *Cactus*, clothe the soil, which is formed of fine white sand; and the vegetation having been refreshed by the rain and hurricane of the preceding night, we traversed this district in a cheerful frame of mind, till the *Fazenda da Serra Branca*, charmingly situated on the declivity of a mountain of the same name, received us hospitably for the night. The inmates, amiable people, possessed of peculiarly pleasing and simple manners, plied us with many inquiries about our native country, concerning which they entertained many strange ideas. The next morning the master of the house kindly helped us to load our mules; but when on the point of starting, we missed one Arriero Miguel, whose absence we had not previously remarked. After seeking him a long time, we found him lying under a tree, in a state of apathy and apparently mental confusion. On inquiring the cause, he informed us with some difficulty, that he feared while searching for the mules, that he had been bitten by a serpent in the tall grass, and to our great distress, we observed a wound and swelling on each side of his foot, which certainly appeared to proceed from the sting of some venomous creature. We instantly administered large doses of *Eau de luce*, with *carbonate of Ammonia*, and *oil of amber*, dissolved in a solution of soda; we scarified the wounds, burnt them with gunpowder first, and then with a red hot iron; endeavouring all the while, by the most soothing and encouraging words, to calm his mental distress. The injured part did not seem much swollen; but the patient's pulse was unusually violent and full, his eyes fixed, half-closed, and suffused with blood, and his voice tremulous and feeble. He complained of painful contractions in the joints, giddiness and pain in the head and back, and such was his presentiment of approaching dissolution, that he yielded very unwillingly to the remedies proposed, and asked for nothing but to be left in peace. According to all appearance, the unfortunate man had been bitten some time previous to our discovering him, and the terrible effects of the poison had already sapped the foundations of life in his large and powerful frame.

In compliance with the desire he expressed, which was seconded by the hospitable *Fazendeiros*, we left him under their charge, as the time required for his perfect recovery, which in this country is believed not to take place in less than forty days, was too great to allow of our waiting for him. We sent for a *Curadeiro*, gave him the necessary medicines and strict rules for the treatment of the patient, and recommending the poor suffering creature to the kindness of the sympathizing *Fazendeiros*, we took our departure. All their care, however, proved fruitless; for we received some days afterwards, from a *Tropeiro* who travels on this road, the sorrowful intelligence that Miguel had expired the same day. This mournful circumstance probably gave rise to the report that one of ourselves had thus perished, of which the rumour quickly spread to Bahia and Minas, whence, and from Maranhao, we subsequently received many letters, expressive of friendly and anxious interest in our welfare.

North of the Serra Branca, the character of the vegetation gradually changes; passing from the *Mimosa*, to that which is here called *Agreste*. We traversed beautiful green meadows, (*varedas*) interspersed with *Catinga* woods, and came to the *Fazenda Cachoeira*, where we saw a very extensive establishment appropriated to the rearing of cattle. Several hundreds of cows and calves were just driven out of the *curral*. Proceeding to the north, we entered the beautiful woody plains, called *Campos de Santa Isabella*, where *Joa trees*, casting their shadows far around, and groups of *Palms*, presented a most pleasing variety of landscape. Numerous herds of black cattle lay basking in the shelter of these leafy masses, which reminded us of the Linden trees of our native land; and innumerable herons, with different kinds of ducks, gave life and interest to the occasionally seen ponds, that glanced between. In the evening we encamped near a bushy pool, where a slave-dealer from Bahia had already bivouacked with his troop of forty young blacks, which he had just purchased, and was taking with him to *Aldeas Attas*. This company of youthful Ethiopians, which consisted of both sexes, gave themselves up, after the manner of their country, to the most extravagant mirth, and in the open field excited themselves, by lascivious dances, singing, shouting, and mutual encouragement, to a height of almost Bacchanalian frenzy. It was late at night ere the uproar became calm, and we obtained some sleep; whence we were quickly roused by the slave-dealer, who, with every token and expression of deep distress, came to crave our advice and assistance; informing us that nearly half of his sable party were violently ill, in consequence of having plundered a plantation in the vicinity, and eaten the raw *Mandiocca* roots, which they mistook for the wholesome *Aypion.* Their symptoms were exactly those of persons who had taken poison—headache, vertigo, trembling, inflammation and cramp, accompanied with vomiting, manifested themselves severely in all who had partaken of the deleterious food. By our advice the owner administered emetics to some, and tobacco injections to others, with large doses of oil and the expressed juice of the *Mandiocca plant;* which, by a highly curious provision of nature, forms an antidote to the injurious properties of its own root. At sunrise we certainly beheld a scene of great confusion in the negroes' camp; prostrate bodies, and symptoms of fever and suffering were sufficiently apparent; still no individual life was lost in consequence of this act of imprudence.

As we found it impossible to reach the *Fazenda do Bom Jardin* on the following night, we were again obliged to encamp in a district, peculiarly marked by its numerous woods of *Carnaiiva*, reminding us of the scenery in Minas Geraës. Here, too, the *Palms* occupy the lowest and most swampy spots, and the banks of brooks and ponds; but they do not rise so majestically as does the *Buriti Palm*, over the neighbouring clusters of bushes and low trees in the Mine district.

Before coming to the *Fazenda do Bom Jardin*, we again fell in with the chalky-sandstone formation, on the scattered square-looking hills, among which winds the Rio Caninde. One branch of this river takes its rise in the *Serra Topa*, and the other on the *Serra dos dois Irmaos.* We also saw the channels of many pretty little brooks, now dried up, like the river which they feed, but still giving a pleasing character to the landscape by the verdant line which marks their serpentine course. When following the track of one of these brooks, I suddenly emerged from the bushes which fringe it, and obtained an open prospect over an extensive swampy valley, full of *Palms*, backed by a remarkable range of square-shaped sandstone hills. Such views are not uncommon in this district, and are little seen elsewhere.

On the 1st of May, after having been obliged repeatedly to cross the Rio Caninde in its devious course, we reached the *Fazenda Pocoes de Baixo*, being the first of the 33 Fazendas in Piauhy, which are maintained at the public cost. Domingos Alfonsa, from Mafri near Lisbon, towards the end of the 17th century, established a great number of farms in all parts of the province of Piauhy, after his numerous inroads on the native Indians had shown him the advantages which this whole tract of country presents for the rearing of cattle. After his decease, the Jesuits became heirs to thirty of these estates, on condition that their profits should be applied to benevolent purposes and for the establishment of new farms. On the expulsion of the Jesuits, this great property fell to the state, by whom the management of the thirty original farms, and of three more, purchased by the Jesuits, was given to three Inspectors. The *Inspecçao do Caninde* includes eleven Fazendas in the district of Rio Caninde; that of *do Piauhy* an equal number on the river of the same name; while *do Nazareth* has the remaining eleven on the Rio Parnahyba, north of Oeiras. Each *Inspector* receives an annual salary of 300,000 réis; and has the command of the *Vagueiros* (shepherds,) who superintend the different *Fazendas*, (one *Vagueiro* to each *Fazenda*,) and who continue in office from three to five years; being elected, not by the inspector, but by the governor of the province. The pay of these *Vagueiros*, who frequently serve for years without remuneration, is derived from the fourth part of the cattle and horses annually reared. They also have a free dwelling, with the produce of pigs, goats, and sheep, and the profits of the butter and cheese—articles not placed to the royal account. The *Fazendeiros* are also provided with slaves by government, to whom they are only required to give their clothes and food, and they are able to procure every necessary of life for themselves, from the produce of the cultivated land, and cattle which they rear; for doing which they are provided with ample advantages. They likewise receive a tenth of all the young cattle which they breed.

With regard to the breeding of animals, which is the staple trade, if I may so call it, of these provinces, its success, or otherwise, wholly depends on the quantity of rain which falls in the season. Should the wet weather commence in the end of December, and attaining its greatest height in February, continue uninterrupted till it gradually decrease in the close of April, the numerous rivers, ponds and ditches, are then filled with water; the ground becomes soft, and pasturage is good and abundant. During this period the *cows*, which at other times, like all the cattle here, remain in the open field, are driven into the enclosures, where they stay at night, and are milked, for the purpose of making cheese, every morning. From the month of May, the cows are again permitted to go at large in the fields. It sometimes happens that the month of February passes without rain, when it becomes impossible to make cheese, from the small quantity and poor quality of the milk; in which case all the herds of cattle except a few cows for the use of the *Fazendeiro's* family, are left in the open meadows; and great sickness is sure to occur among the horned stock, which decreases as rapidly as it had increased during the fertile years, when there was abundance of water. The ox of this country is large and well-shaped, distinguished by his long, pointed, and twisting horns, which stand wide apart, as well as by the variety of its colour. The horse is not of an equally good race with the cattle; it is seldom more than middle-sized, has weak bones, and is short-lived. Those colts which are handsomely shaped are broken in with extreme care. In order to accustom the animal to step firmly, and lift his feet high, a broad round cushion is placed above the fetlock, and the hoof is suffered to grow very long, the latter being also useful in saving shoes; for the horses are rarely shod here. The roads in this province and Maranhao are soft and swampy, unlike those of Bahia, Minas, and Rio Janeiro. The horses seldom live longer than twelve years; partly from the irregular supply of fodder, and the violent transitions of climate to which they are exposed; and perhaps still more from the excessive fatigue they endure when employed in hunting, on journeys, and in quest of the strayed cattle. A disease to which they are here very subject is, an enlargement of the rectum: it often increases dreadfully before the poor animal dies of the consequent inflammation. Horses that suffer from this complaint, analogous to what is here termed *Bicho do cu* in the human subject, are called *Cavallos rottos.*

The cattle belonging to the king are annually sold to the highest bidder, the prices varying extremely: thus in 1818, an ox fetched 5400 *réis*, and the very next year, 8400. In 1818, the inspector of Caninde, which is the largest of all, sold 1100 head, which produced to the king eight *contos de réis*, (or 22,233 *florins.*) The others are not nearly so profitable; but they may be considered to sell altogether annually about 3000 oxen, that, fetching 6000 réis each, give an amount of 18 *contos de réis*, as the revenue from the three *Inspections.* Doubtless a much greater income might be derived from the source, if the *Fazendeiros* were content to use a smaller number of the cattle themselves; for, in successful years many of the *Fazendas* rear from 700 to 800, and not unfrequently 1000 young bullocks a-piece in the season; but a vast number are slain for the support of the servants; many calves perish from eating deleterious plants, from the attacks of venomous insects, bloodthirsty bats, and voracious ounces; while poisonous snakes annually destroy a considerable portion of the young breed. And although many of the cattle-yards have twenty slaves, half of which would suffice to take care of a herd consisting of 1000 head; yet none of these people are employed in raising *maize* and *mandiocca* for food, but subsist entirely on the flesh of the cattle.

In short, it may be fairly said, that in no country where nature is so lavish of her bounties, is man so wasteful and improvident in his use of them as here, so reckless of profiting by his advantages. Formerly, each individual farm consisted of three square leagues of land; and a league of neutral ground lay between each, on which the herds of these neighbours might feed in common, without however, being allowed to settle upon it. But generally the free blacks or mulattoes are now suffered to erect their little dwellings or farms on these districts, though the proprietors of the *Fazendas* do not give up any part of the land; because they consider a large extent of it indispensable to the prosecution of their business. Doubtless it is necessary, when drought takes place, that the herds shall have a considerable range on which they may seek pasturage and water : still the sinking of wells, and due attention to irrigation, would prevent the most serious evils that now accrue from a continuance of dry weather. By adopting these means, too, the present scanty population might be safely increased; and this lovely tract of country would acquire that importance which it justly deserves; and its peculiar natural advantages would be appreciated in Brazil. Between the *Fazendas Campo Grande* and *Castello*, we had to cross a part of the *Serra Imperial*, a mountain of similar freestone formation with the *Topa* and *Serra Branca*. We were repaid for the labour which it cost us to travel over the narrow roads, obstructed with blocks of stone, by the view which we obtained of the fresh verdant *Campos*, and scattered *Catinga woods*, which we reached before coming to the *Fazenda Bréjo*, where the *Inspector do Caninde* has his residence. Here we met with the kindest hospitality; and our French servant was even solicited to remain, and marry, and settle among them. From Bréjo to the next royal *Fazenda*, called *Ilha*, the way was highly delightful, and by its undulating hills and dales, continually reminded us of the beautiful fields of Minas. The *Catingas* gave place to light airy shrubs; and in the well-watered lowlands the *Carnaiiva Palms* grew intermingled with stately woods, of which the sight was peculiarly attractive. Blue *Aras* (*Psittacushyacynthinus*, Lath.) that build and breed in the thick tops of these *Palms*, flew cawing and screaming past us, and the great *Anu* (*Crotophagus major*, Lath.,) frequently uttered its stammering cry from the banks of the Canindé, which we now crossed for the last time, in order to pursue the remainder of our way on its right bank. In the vicinity of *Ilha*, as well as at *Castello* and *Mocambo*, the ground frequently exudes common salt and saltpetre; these are the most northern places in which we have met with, or heard of, these substances in our travels; but the Brazilians possess these important productions of the soil in many districts besides. The common salt here is much mingled with other and injurious ingredients, often producing diarrhæa, and similar disorders.

The lower we descended into the delightful bushy valleys through which the Rio Canindé pursues its way, the more strikingly was the vegetation marked with the character here called *Agreste*;—grayish-green tufts of *grass*, numerous trees of the genera *Qualea*, *Phæocarpus*, *Jacaranda*, *&c.*, their branches, peculiarly crooked in their growth, reminded us of what we had been accustomed to see at Minas; and finally, our old acquaintance, the *Buriti Palm*, appeared and greeted us. The soil consists of reddish sandstone, often mixed with courses of quartz and layers of liver-coloured sandstone; and it rises into many low green bush-covered hills, flat at top, and ascending one over another like terraces.

On the 3d of May, at sunset, we reached the capital of Piauhy, the Ciudade de Oeiras, whose irregular rows of houses meet the traveller's eye, when he has gone round the last hill. The worthy *Capitan Major*, *Senor Joao Nepomuceno de Castello Branco*, descended from the early conquerors of this country, had already kindly provided for us, and a house stood ready for our reception. In the person of the governor, Colonel Balthazar de Souza, we had cause to respect a man of learning and amiable manners; who, though on the point of departure for the scene of his new appointment, as governor of the *Province of Espiritu Santo*, omitted nothing which could render our residence in Oeiras both improving and agreeable.

Oeiras, now the capital of the province of Piauhy, was, in the year 1724, erected to its present dignity from being only a village, and bearing the humble name of Villa da Mocha. It must be confessed, that, with the title of a city, it is still only an insignificant paltry place, consisting of some irregular streets of low mud-built white-washed houses. The number of inhabitants is reported to government as a little more than fourteen thousand. Two little streams which fall into the Rio Canindé, at a league's distance, afford good drinking water, with a taste, however, of saltpetre. The heat is great; the thermometer rising towards noon, during the hot months, almost always to 30° of Reaumur. The rainy season commences, though almost imperceptibly, in October, is at its climax in February, and ends in April. July, August, and September, are the driest months. The trees begin to put forth their buds in February and March, many of them, indeed, being covered with flowers during the hottest weather, which fall off, when the foliage afterwards appears. Generally, the prevalent wind here is from the south, and this is its constant quarter during the dry season. On the whole, the climate of Oeiras may be considered healthy, and the custom of eating beef helps to make the inhabitants strong; though it must be owned, that in this neighbourhood, and especially at the Villa de Parnahyba, an obstinate ague prevails during the wet season, and our own people experienced a decided increase of the feverish symptoms which had afflicted them ever since their march over the *Sertao de Bahia*. While staying at Oeiras, we had many applications from sick people; for there are but two surgeons, and no physicians in the city: many of the cases were weakness of stomach, *Tympany*, and *Dyspepsia;* also *Cardialgia*, and a peculiar disease called *Engasco*, and consisting in obduration of the orifice of the stomach, and affection of its cartilages. Inflammation of the throat and eyes, with cataract and film over the eyes, and *arcus senilis*, are particularly frequent in the dry season. Lastly, we noticed the prevalence of nervous diseases, as *St Vitas' dance; Cramp in the jaws;* and two remarkably bad instances of *Diabetes*. The apothecaries' shops we found in a most pitiful state, their medicines few, and those rendered almost inert from having been brought, perhaps long before, from Bahia and Maranhao, where also they had lain for years. The hospital, peculiarly devoted to the use of the military, contains forty beds.

The principal church of N. Senora da Vitoria, and the two chapels, are insignificant buildings. Here the Jesuits had a college, now the residence of the clergyman (*Vigario,*) who is empowered to exercise certain episcopal functions by the bishop of Maranhao, the next authority under the governor of Oeiras, who, though inferior in rank to the governor of Maranhao, is perfectly independent of him, and is the financial administrator. Here are garrisoned two companies of troops of the line, with their commandant; forming the entire military strength of the province. The whole population of Piauhy, amounting when the troops were levied, to 71,000 souls, all that were capable of bearing arms, were organized into three regiments of cavalry, and two of infantry.

From the great distance at which this little city is situated from the coast, (the chief town of Pernambuco, Recifé, being two hundred leagues distant to the east, and that of Maranhao, S. Luiz de Maranhao, an hundred leagues N.E.), it is not surprising if an inferior state of education is observable here; while, on the other hand, there exist more simplicity of manners, kindness, and hospitality, than are seen in larger and more populous places. Oeiras ranks next in civilization and wealth to Villa da Parnahyba, a flourishing place, from its situation on the sea-shore, and the considerable trade which it commands in *cotton*, *tobacco*, *skins*, *tallow*, and *salted meat.* Oeiras itself can never be a depositary for the productions of the interior of the province: the other *Villas*, as Pernagua, Vallença, Campo Major, Marrao, &c., carrying their produce in preference, either immediately to the sea, at Bahia, Paranahyba and Maranhao; or to Aldeas Altas, situated on the navigable river Itaapicura, which latter is the most eligible spot for the staple trade of Maranhao.

The whole district of Oeiras abounds in picturesque and highly varied prospects; its numerous hills, and low mountains of red sandstone, are sometimes rent into bare fissures, at other times fringed with bushes, while the meadows which stretch between the elevations are covered with gray and green tall-growing *grass.* The traveller lingers in the simple pastoral scenery, akin to the dispositions of the inhabitants, and admires the various productions of the soil, and the fine climbing *Cucurbitaceous plants* and *Passionflowers,* which twine round the trees, and the fresh gushing springs that bubble here and there out of the rocks. In the various mineral productions of this country we also found much interest, and would gladly have remained some time in Oeiras, especially to visit the *Fazenda Réal de Caxé,* ten leagues distant, where *sulphur* is said to exist in great abundance. But the state of our health forbade our examining this interesting fossil in its native place; for we both had daily attacks of slight fever, which would have effectually stopped our travels if it had gone on increasing. So, faithful to the maxim which enjoins that the stranger shall quit Oeiras at once, if he finds the place to disagree with him, we prepared to depart without the least delay, and to proceed immediately to Aldéas, forty leagues distant—the goal of a journey, of which the fatigues began to be disproportioned to our stock of strength.

In the provinces of Bahia, Pernambuco, and Piauhy, are many plants employed as remedies and for several economical purposes, which are equally so used at San Paulo and Minas Geräes. I may here also describe two, of peculiar value in this respect, and with which we became acquainted when travelling through Bahia. A species of *Dorstenia,* whose root possesses many stimulating and sudorific properties, and is used in the same way as *D. opifera.* It is called in the country *Contrayerva,* and may be thus characterized, —*Dorstenia,* radice tuberosa, placentis oblongo-ovatis sinu profunde cordato-dentatis, receptaculis orbicularibus superne planis inferne convexis denticulatis.

A second plant is called *Sebipira* or *Sipopira* by the people of Bahia and Pernambuco; it grows to be a large *tree,* and belongs to the *Leguminosæ.* The bark, in which the medicinal virtues reside, is of a bright ochrey-reddish colour, internally fibrous, and granular on the surface: the taste is somewhat austere and stringent; in its medicinal qualities and sensible flavour, the bark has much analogy with that of the *Alchorno.*

The Death of PROFESSOR DE CANDOLLE.

OUR Subscribers will read with sincere grief the following notice of the death of Professor De Candolle, which has just been communicated to Mr Bentham by the afflicted son:—

MON CHER AMI,

Je viens d'étre frappé du coup le plus douloureux. Mon père est mort avant-hier, dans la soirée, après de longues souffrances, adoucies, cependant, Dieu merci, à l'approche du dernier moment. Les secours de l'art etaient impuissans contre le progrès de l'hydropisie. Le corps n'avait plus de forces à opposer et depuis plusieurs semaines nous avions perdu toute éspèrance. La separation n' én est pas moins affreuse. Mon père ne se faisait pas d'illusion sur la gravité de sa maladie, mais le calme et la résignation avaient grandi chez lui avec les progrès du mal. Vous partagerez nôtre profond chagrin, j'én suis bien sûr, vous que mon père distinguait parmi tant de Botanistes, et qui le lui avez si souvent temoigné.

Madme. Bentham apprendra avec satisfaction que le santé de ma mère, quoique délicate, a résisté à de longues veilles et au chagrin qu' elle éprouve.

Veuillez communiquer cette triste nouvelle a Sir W. J. Hooker et à M. Lindley *de ma part.* Le temps et le courage me manquent pour écrire à plus d'une personne en Angleterre dans ce premier moment.

Conservez moi vôtre amitié qui m'est plus necessaire que jamais, et croyez moi toujours, mon cher Bentham vôtre dévoué et affectionné.

ALPH. DE CANDOLLE.

Genève, 11*th September*, 1841.

XI.—*Account of a New Genus of the Natural Order of* HYDROCHARIDEÆ, *from Southern Africa.* By the Honourable W. H. HARVEY.

[*With a Plate,* TAB. XXII.]

LAGAROSIPHON, *H.*

Flores dioici. *Masc.* *Spatha* sessilis, ovata, compressa, bifida, multiflora[*]; floribus pedicellatis. *Perianthium* 6-partitum, petaloideum, laciniis exterioribus majoribus. *Stamina* 6, 3 antherifera perigonii laciniis exterioribus opposita, tria ananthera, filiformia, elongata, iisdem alterna: *filamenta* brevia, filiformia; *antheræ* profunde bifidæ, basi acuminatæ, demum deflexæ, biloculares, loculis pollinis granulas magnas subdecem, bifarias includentibus.

Fem: spatha sessilis, oblonga, compressa, bifida, uniflora; flore sessili. *Perigonii tubus* longissimus, filiformis, basi cum ovario connatus; *limbus* sexpartitus, petaloideus, laciniis exterioribus majoribus. *Stamina ananthera* 6, filiformia, brevia. *Ovarium* adnatum, uniloculare, placentis parietalibus tribus. *Ovula* 1—2 utræque placentæ ad basin inserta, erecta, anatropa. *Stylus* cum perigonii tubo connatus, æquilongusque; *stigmata* tria, bipartita, segmentis lanceolatis, mammillatis. *Pericarpium* membranaceum, di-trispermum. *Semina* cylindrica, erecta, arillo parvo carnoso suffulta. *Embryo* exalbuminosus, orthotropus, extremitate radiculari infera.

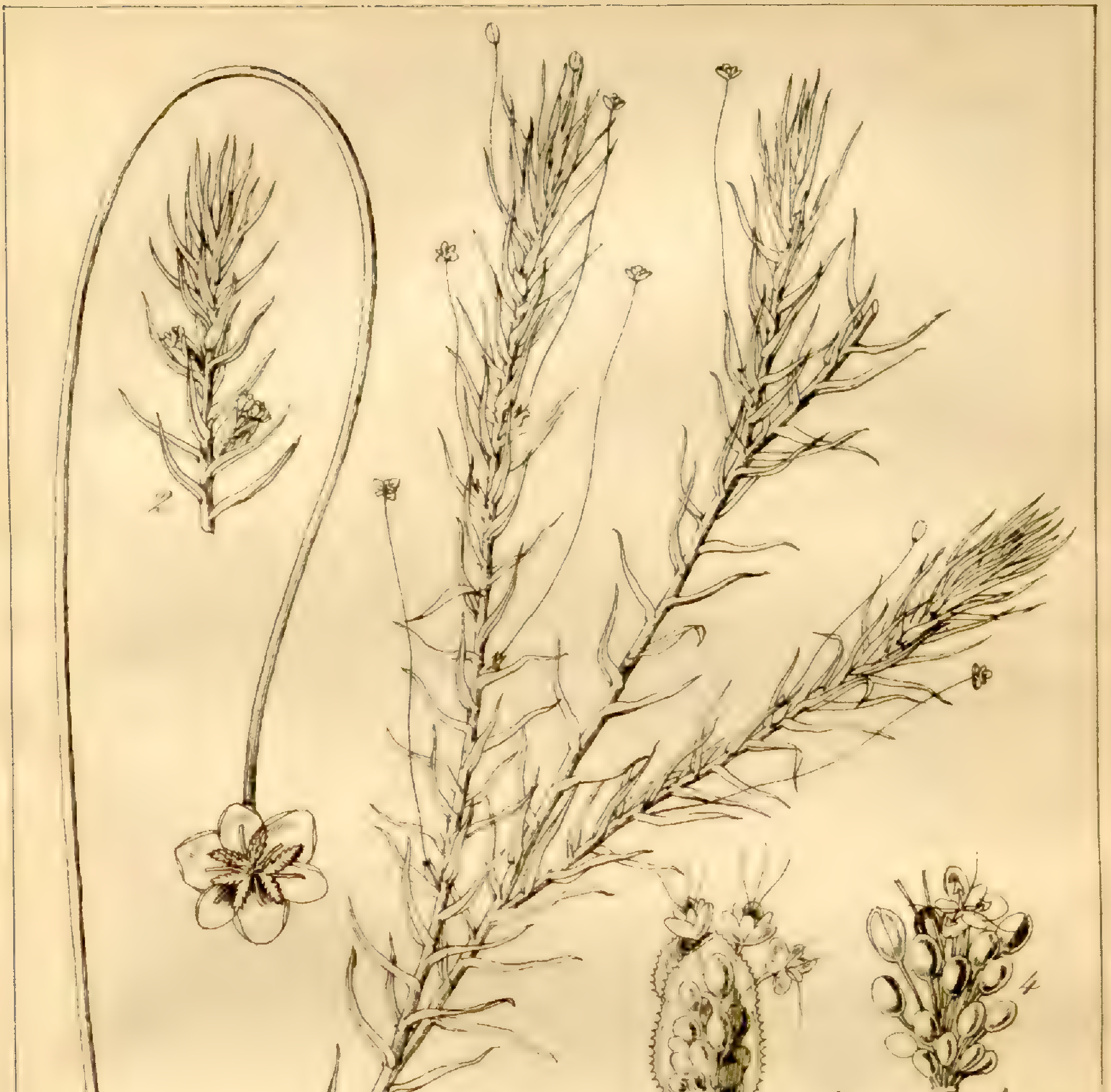
Genus *Hydrillæ* proximum.—Nomen λαγαρος, *tenuis,* et σιφων, *tubus.*

L. *muscoides,* Harv. MS.—TAB. XXII.

Hab. Rivulis innascens. "Albany," C.B.S. *C. Zeyher.* ———? *Drege.*

Herba fluitans, ramosa, 1—2 pedalis, gracilis, pellucida. *Folia* alterna, opposita, subverticillatave, lineari-attenuata, uninervia, cartilagineo-marginata, serrulata. *Spathæ* axillares. *Perigonia feminarum* natantia; *marium* submersa!

The figure is made from a dry specimen, and I fear the *exact shape* of the segments of the perianth may not be correctly given, as it is almost impossible in the case of such delicately membranaceous, deliquescent and *minute* objects to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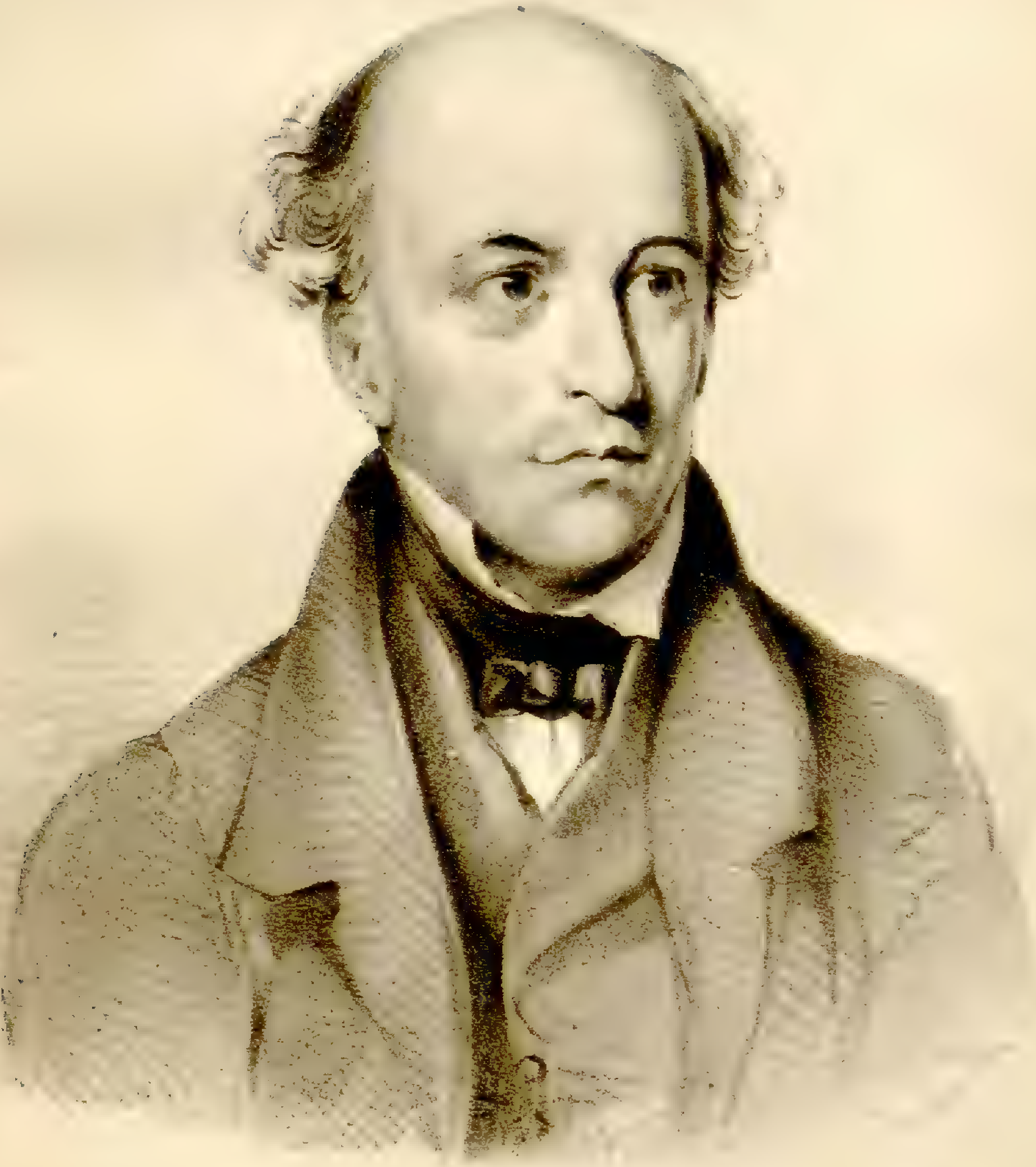
Lagarosiphon muscoides.

Allan & Ferguson lith. Glasgow



Allan Cunningham

restore the precise form after they have once been dried. In all other important particulars, I trust my analysis will be found correct. *Drége* appears only to have gathered the female plant. *Zeyher*, who has likewise found this both in *fruit* and *flower*, has discovered the *male* also. The pollen grains, which appear to be shed under water, are very large for the size of the anther, and constantly set in a double row in each cell. After bursting, the anthers are strongly deflected outwards, what was the acute base being then the apex; or perhaps it would be more just to describe them as *inverted* before bursting, and resuming their normal position on dehiscence taking place. The stalks of the male flowers never much exceed the length of the spatha. The pellucid highly cellular leaves have very much the appearance of those of a *Mnium*. W. H. H.

Explanation of Figures.—Fig. 1. Female plant; *nat. size:—f.* 2. Tip of male branch; *nat. size.—f.* 3. Male spatha; *f.* 4. Do. flowers in cluster; *f.* 5. Male flower; *f.* 6. *Young* stamens to show the pollen; *f.* 7. Female spatha; *f.* 8. Stigmata; *f.* 9. Ovary; *f.* 10. Do. *section; f.* 11. Do. laid open *f.* 12. Ovule; *f.* 13. Leaf:—*magnified more or less.*

XII.—*Biographical Sketch of the late* ALLAN CUNNINGHAM, Esq., F.L.S., M.R.G.S., &c. &c. *By* ROBERT HEWARD, Esq., F.L.S.

(With a Portrait.)

THE late ALLAN CUNNINGHAM was the eldest son of Mr Allan Cunningham, a native of Renfrewshire, N. B. His mother, whose maiden name was Dickin, was a native of Shropshire. She was twice married; first to a Mr Juson, and secondly, on the 20th of August, 1790, to Mr Cunningham, by whom she had two children,—the subject of the present memoir, who was born at Wimbledon, Surry, on the 13th of July, 1791,—and a second son, Richard, born 12th of February, 1793.* At this place his parents resided for some time,

* This only brother of Allan Cunningham was unfortunately killed by the natives of New South Wales, while attached to Major Mitchell's

and there Allan's earlier years were passed. In due course he was sent to school at Putney, to the academy of the Rev. Mr Adams, under whose care he received an excellent education; and of whose attentions he ever spoke with strong feelings of affection and respect. After leaving school, he was for a short time in a Conveyancer's office in Lincoln's Inn; but the dull duties and prolix technicalities of the law were subjects ill fitted for the investigating mind of Allan Cunningham; and fortunately for science, an introduction to botanical pursuits was placed in his path, by his being engaged by W. T. Aiton, Esq., at the time the second edition of the *Hortus Kewensis* was preparing. This situation was also happily the means of introducing him to the notice of R. Brown, Esq., while that talented gentleman and profound botanist was superintending the progress of the latter volumes of the above work through the press. Shortly after the publication of this work (1814), the political aspect of Europe reverting once more to a state of peace, the subject of sending out botanical collectors was revived by the late lamented Sir Joseph Banks, and the superintendent of the Royal Botanic Gardens at Kew (Mr Aiton), and the government having acceded to the application of those gentlemen, arrangements were subsequently made for forwarding two botanical collectors to the southern hemisphere. Sir Joseph Banks, having recommended Allan Cunningham as being competent to fulfil the necessary duties of botanical collector to the Royal Gardens at Kew, he received his appointment, which bears date the 9th of September, 1814; and on the 3d of October, in company with Mr James Bowie, who was joined with him in the commission, embarked at Spithead on board the Duncan 74, commanded by Captain Chambers, and finally sailed from Plymouth on the 29th of the same month. On Christmas-day they sighted Cape Frio, and came to an-

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exploratory expedition to discover the course of the Darling River, in April, 1835. For a memoir and portrait see *Companion to Botanical Magazine*, vol. II., p. 210. *Mitchell's Journeys in Australia*, vol. I. p. 177, &c.

chor at Rio de Janeiro on the 28th of December. For the next three months our travellers remained at Rio, awaiting the dilatory proceedings of the Portuguese government in granting them permission to travel in the interior, procuring their passports, and making necessary preparations for their journey. During their residence at Rio, collections were made of the plants and seeds found in the vicinity. The botanical gardens were also visited, and a correspondence instituted with the superintendent of the Botanic Garden, Senhor Gomez, and also with M. Langsdorff, who at that period resided in Rio, and who kindly showed them his collections, and afforded them much information for their future proceedings.

On the 3d April, they took their departure from Rio for San Paulo; on the 5th they were detained at a Venda, near Taguahy, until the 13th, by continued rains, which flooded the country they had to travel over, and rendered it impassable for a time. They also found themselves compelled to increase their train of mules, in consequence of the inefficiency of some of the animals they had purchased in Rio; they also hired a Portuguese to accompany them, and take charge of their negroes, mules, and baggage. Shortly after leaving the Venda, they commenced the ascent of the mountains by a very winding road, exceedingly rough, and full of holes and channels formed by the heavy rains, and now filled with water, and encumbered with large fragments of rock that had fallen on it; the mules, being frequently compelled to stop from the steepness of the road, causing their loads to shift, rendered the ascent exceedingly fatiguing and tedious. Having, however, reached the summit, they halted for the night at a Rancho or shed, called a roça de Reij, where they suffered much from the cold, the upper part of the mountain being enveloped in clouds. Among the plants collected since their departure from Rio were species of the following genera:—*Pontederia*, a polyandrous aquatic with yellow flowers (*Limnocharis Humboldtii*), *Aristolochia*, *Menyanthes*, (*Villarsia*), *Oncidium*, *Guarea*, *Gomphia*, *&c.* On the 14th, Mr Cunningham's journal states—" We continued our journey, and having travelled for thirteen hours over the mountains, arrived in the evening at a large Rancho which is about half-a mile to the right of San Joao Marcos, and where we passed the night. On the road near this place, we saw a species of *Buginvillea*, very beautiful, and a *Ruellia*, with red tubular flowers. The road this day was in many parts rugged and steep, and we arrived in the course of the afternoon at a river, where we were obliged to unload the mules and carry the luggage over, to avoid its being wetted.

" 15th. In the course of last night, we unfortunately lost our iron pot containing our breakfast. It was stolen by some of the troopers, although our servants slept round the fire the whole night. We were obliged to remain all the next day at the Rancho, being detained by one of our mules having escaped from us; and it was not caught till too late to proceed farther this night.

" 16th. Continued our journey early this morning; arrived at the Rio de Pirahy, which divides the captainship of Rio de Janeiro from that of San Paulo; conveyed our luggage over the river in a canoe, and swam the mules across, passed the mountains, and reached a little Venda near the Rio de Pedras in the evening. On the road saw species of the following genera that was new to us:—*Begonia*, *Solanum*, *Lobelia*, (scarlet-flowered,) and *Justicia*.

" 17th. Left the Venda and continued our journey: stopped at a small Rancho at mid-day to rest our mules which were much fatigued; dined in the usual manner upon Feijoens, or black Negro beans, boiled. Proceeded on our march, and halted at a Venda at eight in the evening. We this day saw large trees of *Araucaria* (*Brasiliensis*) near the road, also a species of *Berberis*, and a purple-flowered *Bignonia*.

" 18th. Remained at the Venda the whole of the day to rest the mules; at a small distance from the Venda saw more of the *Araucaria*.

" 19th. Proceeded on our journey this morning, and arrived at Lorenzo at three P.M.; on the road collected specimens of a beautiful orange-flowered *Epidendrum*, also of a *Canna nov. sp.* and a species of *Ruellia* allied to *R. cristata.*

"20th. Resumed our journey, and arrived at 7 P.M. at a small Rancho near Estiva. The hedges were formed of a species of *Bromelia* (*Pinguin?*) with their fruit in bunches nearly ripe.

"21st. Left the Rancho at daylight, and continued our journey to Mineiro, where we arrived at 3 P.M.

"22nd. Left Mineiro at 7 A.M., passed Pau Grande at 12, and arrived at the Villa de Lorena at 2 P.M., where we put up for the day at a very comfortable Venda with a spare room, having a door with a lock and key to it; we had not lodged in such a room since we left Taguahy. On the road we saw some Indian children with the flowers of a species of *Amaryllis,* which they had gathered in the neighbouring wood for the purpose of ornamenting themselves. Found a scarlet-flowered *Justicia*, *Bignonia* sp. with thick yellow flowers, and another species with small purple flowers and nerved leaves. In the ditches on the roadside we saw *Thalia dealbata.*

"24th. Resumed our journey to-day, having given the mules a day's rest yesterday; passed the Villa de Guaratinguitta at mid-day, and arrived at a small Rancho, having travelled about six leagues, or twenty-four English miles; collected seeds of several plants that we had previously only found in a flowering state. This day we passed several orange trees laden with fruit, which were a great refreshment to us.

"25th. Left our Rancho at 6 A.M.; passed the Villa Pendamhougaba at 11 o'clock, and arrived at Taubaté at 4 P.M., much fatigued. This day we saw two species of *Clitoria*, and near a rivulet a beautiful scarlet-flowered diadelphous shrub, probably a *Glycine*, also a dark purple-flowered *Rhexia*, and a species of *Spathodea?* with yellow flowers and a purse-shaped pod, covered with a soft spungy substance. The open Campo, through which we passed, was much covered with ant hills, some of which measured six feet in height.

"26th. At Taubaté, resting the mules in the vicinity of the town, found several species of *Rhexia*, and a pentandrous blue-flowered plant, allied to *Exacum*, also a new species of *Menyanthes* (*Villarsia.*)

"27th. Left Taubaté at 7 A.M.; and passing over a Campo, arrived at a Rancho, two leagues short of San José, where we put up for the night, having travelled thirty-two English miles this day.

"28th. Arrived on the banks of the river at Jacarahy at 12 o'clock, ferried our luggage over in a canoe, and swam the mules across: this is the broadest and deepest river that we have met with; travelled two leagues further, (eight English miles,) and put up at a sugar-work for the night. We had no sooner taken possession of our new lodging, than we were attacked by that disagreeable insect the Jigger or Chigoe, which penetrated the skin of our feet in order to deposit its eggs.

"29th. Left the sugar-work and proceeded to Mogy das Cruces, near seven leagues distant, where we arrived at 7 P.M., much fatigued, the evening turning out rainy; and we found the hills very steep. At the base of one of them we found a species of *Amaryllis*, allied to *A. equestris*. It grows in damp shaded situations. The hedges were ornamented with a beautiful climbing *Erythrina*, with scarlet flowers. This day we passed the largest tree of the *Araucaria* we have yet seen.

"*May* 1st. Rested yesterday, and left Mogy das Cruces this morning at 7 A.M., and arrived in the evening at a small Venda, two and a half leagues from San Paulo. Some part of the road ran through a swamp, in which we collected a species of *Pontederia*, also a species of *Eriocaulon* and a *Fuchsia*, with flowers larger than *F. coccinea*, petals revolute. It was a tree upwards of thirty feet high.

"2d. Left the Venda at 6 A.M., and arrived at the city of San Paulo at 10.; went in search of lodgings, and procured them at the house of an English Cabinet-maker, through the medium of Colonel Müller, to whom we had letters of recommendation, and whose kindness, on this and many other occasions, calls forth our sincerest thanks: but for this gentleman we should have met with innumerable difficulties.

"3d. According to appointment made yesterday with Colonel Müller, we met at 12 o'clock, in order to present ourselves and our letters to the governor, the Conde de Palma, who received us kindly; and having read our letters from the Marquez de Arguia and Lord Strangford, promised to grant us anything we wished for in the furtherance of our botanical pursuits; called also on the Conde de Fonseca, to whom also we had letters. We were received very politely by this nobleman, who offered us his house, saying it would be always open to us."

Our travellers resided at San Paulo, and its vicinity, above three months, during which period they collected a rich harvest of seeds, plants, and specimens. On the 14th of August, they left San Paulo on their return to Rio, making collections on the road, and at the different places they halted at, and reached Rio once more on the 28th of September.

The next year was passed in visiting places in the immediate vicinity, or at a few days' journey from the city, among which may be mentioned the Corcovado mountains, Tejuco, the Organ Mountains, Somanbaya, Padre Correa, &c. From all these places collections of new and interesting plants, seeds, and specimens, were forwarded to England, among which may be mentioned the following as some of the results of their various journeys:—*Jacaranda mimosæfolia*, *Gloxinia speciosa*, *Bignonia venusta*, *Calathea zebrina*, *Amaryllis calyptrata*, *Passiflora* several *sp.*, *Pothos coriacea*, *Melastoma* several *sp.*, *Cactus speciosus*, *C. speciosissimus*, *C. truncatus*, *Dichorisandra thyrsiflora*, *Gesneria bulbosa*, *Pontederia crassipes*, *&c.*, *&c.* That these collections gave great satisfaction, the following extract from a letter of Sir J. Banks, dated February 13th, 1817, will amply testify:—"Both Mr Aiton and myself have been entirely satisfied with you and Mr Bowie's conduct during your stay at the Brazils. We have already many valuable collections from thence, sent home by you, which do credit to your expeditions, and honour to the Royal Gardens, especially among the *Epidendrums, Tillandsias, &c.*, such as were sent home in boxes; your bulbs also have produced some splendid flowers."

Their journeyings in Brazil now approached a termination. In the month of August, instructions were received from Sir Joseph Banks, directing Mr Bowie to embark for the Cape of Good Hope, and Mr Cunningham for New South Wales; and on the 28th of September, the two travellers separated, both leaving the harbour of Rio on the same day for their respective destinations; the vessel Mr Cunningham took his passage in (the Surry, convict ship, Captain Raine), reached Sydney Cove, on the 20th December, after a pleasant voyage of ninety-five days. On the following day Mr Cunningham landed, and proceeded to Paramatta to report himself to the Governor, Major General Macquarie, by whom he was very kindly and hospitably received. Shortly after his arrival, he took a cottage at Paramatta, at which place he resided during his stay in Australia, in the intervals of his numerous and varied journeys.

Early in the year 1817, Mr Cunningham was made acquainted with the intentions of the Colonial government to send an expedition, under the command of the late surveyor-general Oxley, to explore and trace the courses of the Lachlan and Macquarie rivers, and he was advised by the governor to attach himself to an expedition, the results of which were likely to prove most interesting in a botanical point of view; from the circumstance of the parties having to traverse a country at that period entirely unknown.

On the 4th of April, Mr Cunningham left Paramatta in company with Mr Evans, assistant-surgeon, for Bathurst. The roads at that period being in a very indifferent state, their cattle could make but little progress in a day's march, and a want of bridges occasioned also detentions, so that the party which was overtaken on the road by Mr Oxley, did not reach Bathurst until the 14th. In crossing the Blue Mountains, Mr Cunningham saw a pile of stones that bore the name of *Caley's repulse*, from the circumstance of its being the farthest point that indefatigable and persevering botanist reached in his endeavours to cross the mountains to the westward. After passing Mount York, the character of the country and its botany changed in a remarkable manner, plants that had only previously been found in Van Dieman's Land, were discovered on the bleak faces of the mountains, and new features of vegetation covered the whole scene; neither *Banksia serrata*, or *Lambertia formosa*, were found beyond the mountains, *Banksia compar* taking the place of the former plant, *Daviesia latifolia*, and *Acacia melanoxylon*, (Van Dieman's Land plants), becoming very common, as also that beautiful shrub *Grevillia acanthifolia*, and many others then for the first time enriching the vasculum of the fortunate collector. The party remained at Bathurst till the 20th, on which day they started for the depot on the Lachlan, from whence they were to commence on untrodden ground. On the 25th, they arrived at the depot that had been established on the banks of the Lachlan, for the use of the expedition, and where two boats had been built for the conveyance of their provisions on the survey of the river. Here Mr Cunningham met with the late Mr Charles Fraser, so well known for his indefatigable industry in collecting plants and seeds; he was attached to the expedition for the purpose of making collections for Lord Bathurst.

For the details of this interesting but toilsome journey, the reader is referred to Mr Oxley's work,* in which the results of the expedition, the sufferings of the party from scarcity of water, and the disappointments they experienced, are given at length. It is merely necessary to mention here that the expedition descended the river, which very soon showed signs of approaching a termination; and on the 12th May, their further progress on it was stopped by the river losing itself in swamps, which were named the Lachlan swamps, in S. lat. 33° 15′, and E. long. 147° 45′. Mr Oxley then determined to push forward to the South Coast, so as to strike it about Cape Northumberland. Their boats were consequently hauled up the river's bank, and such portion of their heavy baggage as could not conveniently be carried with them, was left with the boats; and on the 18th, they started with heavily laden packhorses for their ulterior destination. They continued their course, which was nearly S.W., until the 4th of June, when the increased sterility of the country, which they called the *Euryalean Scrub*, and the almost total absence of that most necessary article, water, added to which, the debilitated state of the cattle from want of food, and the rugged travelling they had undergone, induced Mr Oxley to give up his intentions of reaching the south coast, and to alter his course once more to the northward, with hopes of again coming upon the Lachlan, or the swamps in which they lost that river, and thus obtain a supply of water and forage for their exhausted cattle. It was singularly unfortunate that the arid state of the country compelled Mr Oxley at this precise point to make a retrograde movement; for at the most southern point that the expedition reached in S. lat. 34° 15′, they were not more than twenty miles from the then unknown Morumbidgee River, which would to a great extent have relieved their sufferings, supplied their wants, and opened to them a new and interesting field of discovery, that through the above circumstances was reserved for another enterprising traveller, Captain Sturt, whose entertaining volumes* contain so much of interest and information on the interior of this singularly constructed country. After wearisome travelling, and much suffering both of man and beast for want of water; on the 23d, they once more came upon the Lachlan river, diminished to not more than twenty feet wide, running with a generally western course at the rate of 2½ knots per hour. Down this diminished stream they continued to travel with the daily expectation of a termination to their journey from the shallow state of the river, and the continued flatness of the country. At length on the 7th of July, a final stop was put to their further progress westward, by the river once more losing itself in reedy marshes and interminable creeks; and after burying a bottle containing a paper with a short account of their proceedings up to that date, and their future intended route, they turned their faces again to the eastward, and recommenced the ascent of the Lachlan. The course they now took was north-easterly, keeping as near the river as the swampy nature of its banks and the numerous lagoons would allow. On the 3d of August, they crossed to the northern bank of the Lachlan by means of a raft, their various attempts at throwing a bridge across having failed from the great rapidity of the current carrying off the trees they felled for that purpose. They again pushed forward, and were once more fated to be entangled in the same miserable scrubby country that they had formerly named the ***Euryalean Scrub***, and were put to much inconvenience and distress for want of water. A few days' journey, however, cleared them from this wretched district, and they came upon a country diversified by hill and vale, and what to them was of such great importance, well watered; and at length on the 19th of August, after a journey of 150 miles from the northern bank of the Lachlan, they came upon the Macquarie, in the immediate vicinity of what is now known as Wellington Valley. Although their provisions were well nigh exhausted, their apprehensions on the score of famine were dissipated, by finding in the district they were now traversing, large quantities of game, viz., emu, kangaroo, &c., and with the pleasing anticipation of soon arriving at Bathurst, they pushed on with redoubled vigour to reach that station, which they accomplished on the evening of the 29th of August, after an absence of nineteen weeks, the greater portion of which time was of a most harassing and anxious nature. The extent of their journey was about 1200 miles, included within the parallels of 34° 30′, and 32° south latitude, and the meridians of 149° 43′, and 143° 40′ east longitude. The amount of the botanical collections from this expedition, on a rough calculation were about 450 species, principally of the families *Leguminosæ*, *Proteaceæ*, *Epacrideæ*, and *Rutaceæ*. Of *Leguminosæ* Mr Cunningham says, "they vie with all the others in number, in variety, and beauty of their several species."

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* Journals of two Expeditions into the Interior of New South Wales, by John Oxley, Surveyor-general of the Territory, and Lieutenant, R.N., 4to, 1820.

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* Two Expeditions into the Interior of Southern Australia, during the years 1828—31. By Captain C. Sturt, 39th Regiment, 2 vols. 8vo, 1833.

On Mr Cunningham's arrival at Paramatta, he found letters from Sir J. Banks, desiring him to place himself under the direction of Lieutenant P. P. King, R.N., who was appointed to command an expedition for surveying and exploring the north and north-west coasts of New Holland. A small vessel of only eighty-five tons burden, "The Mermaid," had been purchased by the colonial government for the purpose of the survey, and at the latter end of December, she was reported ready for service.

On the 22d of December, the Mermaid sailed from Port Jackson,* taking a southerly course to reach her scene of operations. They entered Bass's Straits on the 31st, and on the 21st of January 1818, came to an anchor in King George's Sound. Mr Cunningham landed at Oyster Harbour shortly after this, and from his journal I shall make a short extract of his remarks on the rich botany of this portion of New Holland.

"Aware that our stay here would be but short, I was the more anxious to employ my time as profitably as it was possible. On the barren dry stony hills and ground rising from the beach, *Banksia grandis* arrests the attention of the collector more particularly than any other of its kindred around it; it forms a small tree of irregular growth, is very abundant, and at this season in flower and young fruit. *Banksia marcescens, B. attenuata, Dryandra armata,* and *D. nivea,* I observed in these exposed sterile spots. Of the *Proteaceæ,* I also gathered specimens of the following well-known genera, *Petrophila rigida*, and a shrub of stiff habit which I suspect is Mr Brown's *Isopogon attenuatus, Adenanthos cuneata*, Lab., a large silky shrub near the shore, also *Hakea oleifolia*, and *H. linearis.* In peaty humid situations on the hills, *Franklandia fucifolia, Persoonia microcarpa,* and *Conospermum teretifolium,* afforded me some fine specimens, as did *Dasypogon bromeliifolius,* a suffruticose plant with a globular head of flowers, and rough harsh gramineous foliage. A leguminous plant, perhaps *Callistachys lanceolata* of Dr Smith, at this period in flower and fruit, decorates the brush on the sands of the immediate beach; *Jacksonia spinosa* was also in flower. Other specimens that I gathered in this walk were the following, *Leptospermum longifolium?* a small tree 12—14 feet high, with pendulous branches. On the immediate shores, *Hibbertia perfoliata,* in humid peaty places near the watering place, *Bæckia speciosa*, a beautiful delicate plant abundant in a rather damp peaty sand, *Epacris* (*Lysinema, sp.*) with large white flowers and attenuated leaves in similar situations; and a sp. of *Tremandra*, whose purple flowers were particularly conspicuous among grass and herbage near our well. *Anigozanthus flavida* is of most luxuriant growth in the deeper peaty spots, when the overhanging branches of *Banksia attenuata* protect it from the more immediate rays of the sun. The stunted timber of the hills are of the *Eucalypti*, of which I have not seen any flowering specimens. I afterwards accompanied Lieutenant King to an island in the harbour (the Garden island of Captain Vancouver); we could discover no traces of any vegetables that might have been produced from the seeds sown by the surgeon and botanist of his vessel, Mr Menzies, who made a fine botanical collection at this place. The island in many parts abounds with rats, which might have long since destroyed every esculent plant thus raised. A *Salicornia* and a *Mesembryanthemum*, perhaps *M. glaucescens*, Haworth, with purple heptagynous flowers, prevailed on its shores as they do in some parts of the mainland. Of the genus *Xanthorrhæa*, I noticed three or four species but none in flower."

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* For the details of Captain King's voyages, the reader is referred to the very interesting work of that excellent officer, published in 1826, and entitled, "Narrative of a Survey of the Intertropical and Western Coasts of Australia, performed between the years 1818 and 1822. By Captain Phillip P. King, R.N.," &c., &c., 2 vols. 8vo.

They continued at King George's Sound until the 1st of February, on which day the wind enabled them to prosecute their voyage. From the 15th of February to the 6th of March, the Mermaid was engaged in the examination of Exmouth Gulf, Curlew River, and the islands of Dampier's Archipelago, on one of which, Malus Island, Mr Cunningham discovered a third species of that very beautiful genus *Clianthus*,* (*C. Dampieri*, A. Cunn.) The plant was also found by Captain King at Curlew River. The sterile character, both of the mainland, as well as of the islands, produced but a very indifferent collection to our botanist. The plant from which Dampier called one of these islands "Rosemary island," was found very abundant: it is the *Eurybia Dampieri*, Dec. (*Conyza Dampieri*, A. Cunn.)

The next point the voyagers landed at was the Goulburn Islands, on the north coast; and from this time (the latter end of March), to the end of May, the party were busily employed in their various duties. Mr Cunningham reaped a rich harvest from these luxuriant shores. Among the many interesting plants discovered, may be mentioned some remarkably striking species of *Grevillea* and *Acacia*, in addition to a very fine general collection. Shortness of provisions now compelled them to leave the coast of Australia for the island of Timor. On the 4th of June, they anchored off the Dutch settlement of Coepang, where they received every attention from the resident, Mr Hazaart, and by the 13th, having completed such supplies as were necessary, the following day they sailed for Port Jackson, where they arrived on the 29th. I shall now make some extracts from Mr Cunningham's observations on the botanical results of this voyage.

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* The type of the genus, *Clianthus puniceus*, Sol. (*Donia*, Don), was discovered by Sir J. Banks in New Zealand, 1769. A second species *C. Oxleyi*, A. Cunn., was found near Regent Lake, Lachlan River, New South Wales, in 1817, by Mr Cunningham. A fourth species, *C. Baueri*, A. Cunn., (*Streblorrhiza speciosa*, End. *Clianthus carneus*. Lind. in Bot. Reg. 1841.) is a native of Phillip Island in the vicinity of Norfolk Island. It was discovered by Ferd. Bauer in 1804, and afterwards found by Cunningham in 1830.

"While at anchor in a bight called the Bay of Rest, S. lat. 22° 17′, E. long. 114° 20′, I had an opportunity of collecting the few subjects of these barren regions, the shores of which appear doomed to perpetual sterility. I discovered some species of *Acacia* and *Proteaceæ*, but, the excessive droughts, increased by the rays of the sun at this season, had so burnt up and destroyed the greater portion of its limited vegetation, that but few specimens were added to my collection; the thermometer ranging in different exposures from 105° to 115° * * *. At Dampier's Archipelago, my collections augmented but very gradually, a sterile sand covered with a *Spinifex*, being the general character of the coast. I however added 50 species; all, I believe, of known genera. * * * * The north coast assumes a much more favourable aspect than that lately abandoned, being in many parts cliffy with craggy shores bounded by mangroves, having elevated forest land in the back ground, where portions of rich soil have been observed, in which I sowed, in various situations, seeds of European fruits and culinary vegetables. I landed at different times upon an island named Goulburn's Island, where I found a new field for botanical investigations, approaching in character that of India; for, among genera peculiar to Australia, such as *Grevillea*, *Pleurandra*, *&c.*, several, indigenous in other countries, hold a conspicuous rank and station; among them are *Justicia*, *Strychnos*, *Dioscorea*, *Flagellaria*, *Ficus*, *Hibiscus*, *Crotalaria*, *Grewia*, *&c.* I discovered a new *Nymphæa*, covering the fresh waters of a lagoon, of the figure and size of *N. pygmæa*. A small island, two miles to the northward of Goulburn's Island, and which at my suggestion has been named Sim's Island, (in honour of the excellent conductor of the *Botanical Magazine*,) afforded me several fine specimens, and some papers of seeds. I have likewise found some bulbs of *Crinum venosum*, Br.? which I have not seen in any other part of Australia. The opportunities of landing on the north coast, and the islands in the vicinity, have enabled me to add to my collections materially, although not to the extent I had reasonably calculated. The aggregate sum of my collections made on the coasts of Australia, does not exceed 300 species."

Shortly after the period of Mr Cunningham's return, he undertook a journey to the Illawarra, or Five Island district; a portion of Australia remarkable for the almost tropical character and luxuriance of its vegetation; and during his stay, (about a month,) he made a very rich collection both of specimens and seeds. For the results I again refer to his journal.

"I returned from a late excursion to the country southerly, with a collection of interesting plants and some seeds found during my stay there, in the diversified country in that vicinity, particularly under the mountain-belt bounding the fine cattle-runs to the westward, whose shaded damp woods afforded me a considerable scope for botanical investigation, although I was in several instances, too early in the season for expanded flowering specimens. I was nevertheless fortunate in the detection of many fine plants, either in fruit or in a partially flowering condition, that I have never examined before. They are, however, for the most part, plants known to that eminent botanist, Mr Brown, a circumstance that tempts me to conclude the vegetable productions of those shaded close forests, full of volubilous and scandent species, to be of the same description as those of the Cedar woods of the Coal River, (Hunter's River,) whence that gentleman, in 1804, could have alone obtained those plants he has described, and which I have again detected two degrees to the southward of it, viz., at the Red Point of the charts, a district wholly unknown to any botanist at that period of time. Among the plants to which I allude, the following are remarkable:—*Cargillia australis*, *Achras sp.*, *Cryptocarya* and *Tetranthera*, genera of *Laurineæ*, a *Podocarpus*, in habit like *Taxus elongatus*, *Marsdenia rostrata*, and *Tylophora sp.*, a singular cork-barked tree, *Duboisia?*, a Palm, which I suspect is the tropical *Seaforthia*, and many others, not clearly ascertained."

Captain King, having determined to survey Macquarie Harbour, on the west coast of Van Diemen's Land, gave Mr Cunningham an opportunity of visiting that portion of Australia. They arrived at Hobart Town on the 2d of January, 1819, and while there, Mr Cunningham ascended Mount Table, since known as Mount Wellington, from whose sides and summit he made a rich increase to his collections. On the 10th they sailed for Macquarie Harbour, where they remained until the 25th, during which period Mr Cunningham made daily excursions in the immediate vicinity of the harbour, and procured a rich collection of its botanical stores.

They returned to Sydney Cove on the 14th of February. Of the botany of Mount Wellington, Mr Cunningham observes—"I made a very interesting excursion to the summit of Mount Table, which presented me with a fair specimen of Alpine travelling, in the sudden transitions of the weather, (being alternately fair, with snow storms,) and with the character of the botany, as may be found in Terra Australis collectively. In this elevated journey I gathered many curious plants, which, although I now find them described by that truly eminent botanist, Mr Brown, were no less interesting to me, who knew nothing of them previously."

Of Macquarie Harbour, he says—"In no situation did I find the botany so novel and otherwise interesting as on the low shores of a little bight, about nine miles up from the entrance, called Pine Cove, from the abundance of the *Huon* and *Adventure Bay Pines*, which its humid shaded woods afford. With the *Huon Pine*, (which may be a *Dacrydium*, or altogether a new genus,) and that named *Adventure Bay Pine*

(*Podocarpus aspleniifolius*, Lab.) I detected the *Anopterus* of Labillardiere in flower; the *Cenarrhenes* of that author in fruit; the beautiful *Carpodontos;* the Sassafras-scented *Atherosperma;* the aromatic *Tasmannia* in fruit; the native Birch;* a species of *Weinmannia*;† some of the *Epacrideæ, Elæocarpus pedunculatus; Gaultheria hispida* in fruit, with several others of like sterling importance. After a minute examination of all the trees of *Huon Pine* that had been recently fallen, I was fortunate in the detection of the young fruit of that most useful tree."

Early in the month of May, the Mermaid was declared ready for sea, and Mr Cunningham prepared to embark on board her for a second voyage to the north and north west coasts. On the 8th, Captain King sailed from Port Jackson. Port Macquarie on the east coast was the first place they put in at; and of the vegetation of this port Mr Cunningham says—"We are not far enough to the northward yet, to observe any decided change in the character of the botany here, as differing from that of Port Jackson. Three-fourths of the plants I had noticed in November last, at the Five Islands, (Illawarra,) to the southward of Port Jackson, and originally discovered by Mr Brown, (probably at Hunter's River,) exist in the most thick woods, investing in patches the immediate shores of this Port. I now view my old friends in another state, and among them some nondescripts, inhabiting the dense forests on the banks of the Hastings, of whom a new *Palm*, (seldom above twelve feet in height,) and a species of *Pothos*, adhering to trees, not enumerated among Mr Brown's genera of *Aroideæ*, are perhaps most remarkable. In the hollows are dark thick woods, bound together with twining and climbing plants of extraordinary size, where several kinds of *Laurineæ* and *Meliaceæ*, of small diameter, as timbers, are to be met with, which, nevertheless, I doubt not will be found useful for building, and ornamental for household furniture.

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* *Fagus Cunninghamii*, Hook. *Journ. of Bot.* Vol. ii. *p.* 150. *t.* vii.

† *Weinmannia biglandulosa*, MSS. *Hook. Icon. Plant. t.* ccci.

The dark forests on the river abound with the *Red Cedar* and *Rosewood* of large dimensions."

On the 21st, they sailed from Port Macquarie to the northward. On the 30th, Captain King anchored in Rodd's bay, on the shores of which Mr Cunningham detected many plants that he had observed on the north coast in the last voyage; but which had been originally detected in the Gulf of Carpentaria and elsewhere, by Mr Brown. On the 3d of June, the Mermaid anchored under one of the Percy Isles. At Cleveland Bay, where they arrived on the 14th, Mr Cunningham made some further collections, and goes on to mention that—"On Palm Island, in Halifax bay, and more particularly on the islands in Rockingham Bay, I noticed plants common to both Indies, viz., *Sophora tomentosa*, *Guilandina Bonduc*, *&c.*, and a beautiful purple-flowering *Melastoma*, (*M. Banksii*,) a genus that I was not aware existed in Terra Australis." On the 27th, after an intricate and somewhat perilous navigation among the innumerable reefs that line the eastern coast of New Holland, they reached Endeavour River; anchoring, in all probability, on the very same spot where Captain Cook and Sir Joseph Banks had done so, forty-nine years ago. Of Endeavour River, Mr Cunningham observes—"Our protracted detention, till the 12th of July, at this memorable part of the eastern coast of New Holland, was occasioned by a temporary loss we had previously suffered off the cloud-capt mountainous land of Cape Tribulation, by the swamping of one of our most serviceable whale-boats, which we replaced by building another from the frame of a spare boat we had on board. Thus the convenient south shore of Endeavour River, which most probably has never been visited since the departure of Captain Cook, in 1770, has been a second time converted into a temporary dockyard. Here was a period of fourteen days that might have been wholly at my disposal, had it not been for the annoyances experienced from the prowling natives, who made a rather determined, but unsuccessful attack, upon the boat-builders, &c., on shore, whilst I was at some distance from the cutter, on an excursion to the more elevated ranges of hills bounding the grassy and flat lands southerly. In my various daily walks in pursuit of Flora, which occupied my time during the first week of my stay there, much pleasure was derived in tracing the steps of Sir Joseph Banks and his learned colleague Dr Solander, and detecting many plants then discovered, that in all probability have never been seen in a living state since that period. Among them were *Grevillea gibbosa*, in flower and fruit, prevalent on the rocky hills; a beautiful bluish-flowering *Nymphæa*, like *N. versicolor*, Rox., expanding itself on the surface of the chains of stagnant pools in the lower lands, and the ornamental *Melastoma Banksii*, clothing the muddy shaded banks of these small ponds. The rocky gullies, trickling with small runs of water, afforded me scope for much minute research; for there, more particularly, the delicate filiform minute *Stylidia*, some small *Eriocaula* and *Xyrides*, appeared to abound, with some *Gentianæ*, delighting in a humid shallow soil. Among the plants observed on a strip of sandy desert, under the range of hills to the southward of our anchorage, I was successful in collecting a number of bulbs, (*Crinum angustifolium*,) which could be but barely traced by the existence of slight vestiges of their decayed foliage lying on the surface of the sand. The summits of the ridges, and more especially the northern sandy shore, added some interesting plants to my augmenting collections. On the arid wastes of the latter, I gathered a most beautiful plant of *Dilleniaceæ*, *Hemistemma Banksii*, R. Br. It was a subject of much regret to me, that, in consequence of the rupture with the natives, my walks, during the last week of our stay at Endeavour River, were either very much circumscribed or wholly prevented. I had determined upon an excursion for a couple of days, at least, to the more distant and loftier hills, whose woods, densely matted to their very summits, would doubtless have afforded me some considerable scope for plodding botanical research. This plan, however, with some minor excursions, was wholly frustrated by the decidedly hostile dispositions of the natives;

and the smallness of our company, not allowing me two or three armed men as a guard, forbade my prosecuting my pursuits in distant walks."

On the 12th of July, the party left Endeavour River, and doubled Cape York on the 24th; and after failing to find an anchorage among the islands in Torres Straits, they stood across the Gulf of Carpentaria. The first place at which they landed on the north coast was, on the banks of a river called by Captain King, Liverpool River. On the 8th of August, they anchored at their last year's anchorage, at Goulburn Islands, where Captain King remained ten days to complete their supply of wood and water. Mr Cunningham was unable to make a second collection this year, from the continued hostility of the natives, and also from a severe attack of jaundice, brought on by the fatiguing examination of Liverpool River.

On the 27th, they reached Vernon's Island in Clarence Strait, which was the termination of their last year's survey. Among the more remarkable places touched at on this voyage on the north-west coast, many may be mentioned,—Port Keats, Lacrosse Island, Cambridge Gulf, where they remained ten days, the peculiar botany of its shores greatly enriching Mr Cunningham's collection,—Vansittart Bay and Port Warrender. The general arid character of the coast on this part of New Holland, although it did not afford species of remarkable beauty, yet a large proportion of them are highly interesting to the botanist, from the singularity of their forms, and their affinity in many instances, with plants natives of the continent of India. One singularity of the vegetation of this portion of the coast is, the paucity of the family of *Proteaceæ,* so abundant to the southward.

On the 16th of October, they sailed once more, with the intention of again visiting Timor, which island, after some delays from the wind and current being against them, they reached on the 1st of November. They completed their necessary supplies by the 9th, on which day they sailed for Port Jackson, where they arrived on the 12th of January, 1820, after an absence of thirty-five weeks and four days.

Of Timor and its capabilities of supplying passing vessels, Mr Cunningham remarks—"The experience of the last year at this settlement having taught us, that many of the lesser comforts, now required for our cabin mess, were only to be obtained by executing the several purchases ourselves at certain periods of the day, in the streets, or in the Chinese shops, rather than trust to the specious kind offices of attention from any agent resident on shore. I landed early this morning (November 2d), to make the best market an individual could, who was a stranger to the established Malayan dialect. Having purchased some fruits, vegetables, &c., for our immediate consumption, I returned on board. The *Tamarind trees*, that form such a salubrious and agreeable shade in the streets of Coepang, are laden with ripe fruit, which I observed was exposed for sale in large quantities, without any other preparation than that of having the external brittle leguminous investment taken off, and then being dried in the sun; after which, the fruits are either made up in small balls, or loosely spread out in baskets. Besides Limes, Citrons, the Jack-fruit (*Artocarpus integrifolia*), although at this period in season, was sparingly exhibited for sale, and consequently dear. The young fruit of a palm, which I suspect to be *Borassus flabelliformis*, is sold in the market for the sake of the semitransparent soft albumen of the very young seeds, which, although insipid, is eaten by the Malays. * * * I landed again at an early hour this morning, (3d,) for the purpose of employing myself on the hills in the vicinity of Coepang, during the whole of the day. *Bombax Ceiba* and *Jatropha Curcas*, the latter apparently planted, in some situations, in lines to strengthen the hedge-rows (principally formed of *Zizyphus Jujube*), bore their ripe fruits, and among the old-described plants, observed so abundantly last year, some few others now presented their fructification, that had been without flower or fruit at the period of our former visit to this settlement. Among these were *Thunbergia fragrans*, *Sansteviera Zeylanica*, *Grislea tomentosa*, which afforded me ripe seeds, *Amyris sp.*, (*aculeata*,) *Cordia*, *sp.* (*monoica?*), a shrub bearing white flowers, and also in fruit, *Cæsalpinea* (*alata*), allied to *C. Sappan*, *Cathartocarpus Fistula*, and *C. javanicus*, were particularly ornamental, bearing racemes of flowers with fruit, the former of the prevailing yellow colour, common to *Cassia;* while the latter were of a pale-purple tint in long pendulous clusters. A shrub, with the habit of *Phyllanthus* (*Fluggia? Willd.*,) gathered last year, again yielded a few ripe seeds. *Tabernæmontana coronaria*, *Helicteres Isora*, *Gærtnera racemosa*, *Jasminum hirsutum*, *Calotropis gigantea*, (a plant of *Asclepiadieæ*, having corrosive acrid juices,) are frequent on the rocky hills near the town. Upon low lands, that had been formerly *Paddy grounds*, and subjected to irrigation, I observed sparingly *Torenia asiatica*, some minute *Justiciæ*, and a dead *Jussieua*. After gathering some duplicate seeds of the last year, I returned to Coepang by a circuitous route of eight miles."

In the month of March, two Russian vessels arrived at Sydney; the naturalist, M. Stein, and painter, M. Karneyeck, attached to the expedition, having obtained permission to cross the Blue Mountains, Mr Cunningham proffered his services to accompany them on their tour. They were absent ten days, and returned on board their ships, much gratified with their excursion, and with the attention they had received from Lieutenant Lawson and Mr Cunningham, who accompanied, and pointed out to them the various remarkable features of that portion of the country which their limited time enabled them to investigate.

The third voyage of the Mermaid commenced on the 15th of June, under rather inauspicious circumstances; for they left Port Jackson with foul weather, which eventually increased to such a degree that, by the cutter's plunging into a head-sea, she carried away her bowsprit, and was compelled to return to refit. On the 13th of July, they took their second departure, under the more favourable omens of a fair wind and fine weather. Their course was up the east coast, and the first place they touched at was Port Bowen. Of the botany of this place Mr Cunningham says—"On the grassy shores, besides a stunted species of *Eucalyptus* (allied to *Angophora lanceolata*), *Banksia compar*, a tree twenty feet high, bearing flowers and fruit, afforded me specimens with good seeds; but much of the botany of several parts of this coast whereon I had landed last year within the Tropic, appeared here very general; and among several of its finer subjects I perceived the *Alyxia* of Cape Cleveland, *Maba geminata*, *Mimusops parvifolia* of Rodd's Bay, and *Santalum venosum*, in shaded situations, bearing young fruit; with *Carissa ovata*, still, however, in no stage of fructification. We (Mr Hunter, the surgeon of the Mermaid, accompanied him) passed through brushes of *Tristania sp.* of Repulse Bay and Endeavour River, among which I gathered specimens of the following genera:—*Hovea* (allied to *H. longifolia*), *Lasiopetalum sp.*, *Leucopogon* (probably *L. imbricatus*, Br.), *Psychotria*, *sp.*, *Xerotes arenaria?* beneath rocks, *Eucalyptus*, two species, *Pleurandra*, allied to *P. ericifolia*, Br., *Comesperma latifolia*, *Senecio*, *Gnaphalium*, *Croton*, *Tephrosia?* *Azorella*, *Bignonia australis*, rich in flower, beautified many a bare rock, with which I detected a species of *Acacia*, not previously seen; it was covered with yellow capitula of flowers, so common to this fine genus. *Daphne Indica* occasionally appeared in flower, beneath the shade of large rocks, flourishing exceedingly, the more in proportion as these situations afforded humidity, so genial to such exuberant growth. I know no plants of all the Australian *Proteaceæ* upon which one's eye rests with so much pleasure (excepting our colonial *Telopea*), as it did upon a splendid arborescent *Grevillea*, (*G. Banksii*, R. Br.,) which now clothed the hills with the abundance of its kind, and now decorated the declivities with the gay richness of its crimson blossoms. Upon descending upon the shore, and doubling a bluff rocky point, covered with *Dendrobium undulatum*, and a few *Filices*, gathered last voyage, we passed a line of beach, abounding with the common purple *Dolichos*, *Ipomea mari-*

tima, and *Spinifex sericeus*, at whose south extreme we entered a very shady matted thicket, consisting of many tropical trees peculiar to such umbrage, (and which we had frequently remarked during our last voyage,) of which *Strychnos lucida*, a species of *Terminalia*, *Santalum ovatum*, and *Olea paniculata*, were the most remarkable. In our return along the beach, I gathered specimens of a species of *Dodonæa*, seen on the shores of Rodd's Bay last year. *Euphorbia sp.*, *Acacia polystachya*, and the *Casuarina* of the last voyage, again afforded me ripe seeds."

On the 27th July, they anchored for a second time in Endeavour River. The state of the place, as compared with its last year's appearance, is thus graphically described by Mr Cunningham.

"Grass and herbage had again densely covered the whole of the cleared spot, and some stumps of large trees that had been cut down on our first visit, had thrown out very strong and luxuriant branches, bidding fair in a year or two more to rear their heads again to their usual stature. Upon walking towards the watergully, we found all was dry; and although some few plants had pushed forth their tender foliage, the general face of vegetation seemed to indicate it to be the height of the dry season. The *Erythinæ* of these shores, (and indeed of the whole line of coast within the tropic,) at this period perfectly bare of leaves, exhibits a beautiful and striking appearance, its naked branches everywhere studded with its scarlet-flowers. I traced a line of rocky gully up to the hills, but found every cavity dried up; nor did I observe any plant of moment in my subsequent route over the hills, on my way back to the vessels, excepting *Grevillea gibbosa*, still bearing its ripe fruit.

"In consequence of the general drought of the southern shore, a party was sent at daybreak to examine the extremity of the northern coast, where water had been observed last year. I availed myself of this opportunity of seeing that district, and accompanied the officer who had charge of the boat's crew at an early hour. We landed at the base of the hills, and found a fine stream of water escaping over the beach (sands), from which our people filled their *baricas.* As this operation would employ an hour, I determined upon an ascent to the summit of the lofty range of hills, whose bare naked slopes seemed however not likely to afford me much scope for botanical research. *Velleia pubescens* is frequent on these hills, where also I gathered fine expanded flowers of *Jacksonia thesioides*, a small pigmy plant, and species of *Indigofera. Clitoria, Hibiscus*, a *Grevillea* (allied to *G. Chrysodendron*), and a shrubby species of *Eucalyptus*, were the more general plants observed till I had reached the ridge, whence descend certain deep ravines densely clothed with a luxuriant vegetation ; these, together with the elevated cavities between what may be termed the shoulders of the hills, exhibit a vast variety of fine plants; generally however of species heretofore collected. A tree belonging to *Urticeæ*, with large radiated laurel-shaped leaves, *Seaforthia elegans*, *Hellenia cærulea* (whose luxuriant growth reminded me of the beautiful *Heliconiæ* of South America), and some *Fici* previously observed, were the most prevalent plants in these shaded thickets. On a second visit I detected *Melastoma Banksii*, bearing flowers and ripe fruit; *Wormia alata*, a tree delighting in humid valleys, was remarked on the rising ground verging on the swamps which were full of *Ceratopteris thalictroides*, (*C. Australasica*, Cunn. Mss.) Large specimens of *Heritiera australis*, with *Pandanus pedunculatus* in fruit, form by a union of their branches on either side of the channel of these streams, an arbour-work, essentially necessary to prevent that excess of evaporation, which otherwise would daily take place in so warm a climate. In tracing a dry gully leading from the hills, I gathered seeds of *Callicarpa pedunculata*, specimens with fruit of a tree of *Myrsineæ*, rising twenty feet high, and having an elliptical drupe; a species of *Cylista* overran the bushes; also *Doodia media*, and *Lygodium semibipinnatum*. Upon passing the swamps, I rose to the sandy ridges, and gathered the following plants and seeds; *Acacia humifusa*, *Glycine lampocarpa*, *Cleroden-*

dron costatum, a beautiful flowering shrub, *Leucopogon ruscifolius*, *Eriostemon Banksii*, *Hemistemma Banksii*, *Melaleuca angustifolia*, *Dodonæa paulliniæfolia*. At the back of the sandy ridges bounding the beach are pools of stagnant water, at irregular distances, in which I gathered two species of *Cyperus*, with some *Gramineæ*. * * * Being desirous to examine the sandy barren tracts near the base of Mount Cook, I quitted the vessel at nine, accompanied by a seaman whose help was afforded me by Captain King. In our route over the hills in the immediate vicinity of the anchorage, I collected a quantity of the ripe fruit of *Grevillea gibbosa*, now very abundantly laden with spherical capsules, as also those of *Banksia dentata*, containing ripe seeds of this fine tropical species. In the lower vales, grooved with water channels, which at this period we remarked as almost dry, I gathered a further supply of the berries of *Melastoma Banksii*, and was in the fullest hopes of being able to procure some ripe capsules of the *Nymphæa*, of this part of the coast. However, I could not discover the least vestige of this beautiful plant, in any of the chain of ponds we minutely examined in our route, where *Philydrum lanuginosum* seemed most prevalent. We traversed several patches of barren land, with, comparatively speaking, little success; gathering however the seeds of *Xyris complanata*, and *X. scabra*, specimens of *Hæmodorum coccineum*, with some few grasses, and fine flowering specimens of *Tristanea suaveolens*, *Melaleuca suaveolens*, *Tephrosia sp.*, *&c. &c.* I had almost despaired of success, in detecting the particular spot where the bulbs of *Crinum angustifolium*, (?) had been observed last year; when, after crossing my track in several directions, we discovered a small strip of sand abounding with them, and having a spade with us, we dug up as many as we could conveniently carry back to the vessel, finding them in an excellent condition for removal."

On the 5th of August they took leave of Endeavour River, and anchored the following day at Lizard Island, where Mr Cunningham took advantage of the detention of the vessel, and made such a collection as the island and his limited time allowed; as he also did at the following places that Captain King touched at—Cape Flinders, Pelican Island, Haggerston's Island, and Cairncross Island; of this latter island, Mr Cunningham observes,—"I landed with Captain King on the western sandy point, which is covered with a small thick brush, having at its extremity a dark shaded damp wood of small extent, where I remarked the following plants; *Guettarda octandra*, a very luxuriant tree, having a stem (hollow) six feet diameter, and whose base is much like the spurred butt of a *Ficus; Maba laurina* bearing green fruits; a large species of *Ficus*, without fructification; *Mimusops Kauki* abounding in fruit; *Cordyline cannæfolia;* and a strong plant of luxuriant arborescent growth, suspected to be of the same natural family as seen last year, and at this time also without fructification. Several unknown twining and climbing plants ascended to the summits of the highest trees, and forming with *Flagellaria indica*, a strong impassable barrier. I had traversed this little wood in several directions without making any discovery, or detecting any plant of importance; when, in my return to the departing boat, I found a liliaceous plant, having an elliptical nerved leaf, as in *Pancratium amboinense.* I hastily dug up all the bulbs of this interesting plant I could find: it grows in damp leafy shaded situations, and although not in flower, little doubt can exist of its being Mr Brown's *Calostemma alba.*"

On the 21st, the party landed again on South Goulburn Island, for the purpose of wooding and watering, and where they were as usual exposed to the mischievous attacks of the natives of that place; but, with the precaution that always pervaded Captain King's movements, nothing serious happened to the voyagers. The greatest inconvenience that accrued was the preventing Mr Cunningham's making extensive excursions, as any attempt to have gone to a distance, from the wood and watering parties, would inevitably have brought him into contact with the armed irritated natives, who were evidently lurking about the vicinity. Sim's Island was also visited again; of the results of his trip on shore, Mr Cunningham observes,

—"We landed at Sansom's head, and having a seaman to assist me, I employed him in digging up a few bulbs of *Crinum angustifolium*, (?) which is generally but thinly scattered over the different parts of the island, whilst I ranged over the rocks in pursuit of other botanical subjects. Among others, I gathered seeds and specimens of the following; *Acacia plectocarpa*, of last voyage; *Boerhaavia pubescens*, *Grevillea agrifolia*, *Haloragis sp.*, allied to *H. racemosa*, *Daviesia reclinata*, *Bauhinia microphylla*, *Euphorbia sp.*, *Sterculia sp.*, *Anthobolus triqueter*, a shrubby plant bearing red fruit; *Bossiæa humifusa*, *Hoya carnosa* (or *nivea*), a plant abundant among the rocks, appearing to suffer much from the extremes of the dry season, which however threw *Flagellaria indica* into an abundant flowering condition, as also the venerable *Tournefortia argentea*, on the north-west beach, which was literally covered with flowers and young fruit. A small tree of *Pandanus pedunculatus* had decayed male flowers, consisting of clusters of long pointed anthers, without any floral envleope, either calyx or corolla: this is the first opportunity I have had of seeing this genus in any other state than bearing fruit. Several plants, among which were *Pimelea punicea*, *Acacia Simsii*, *Dodonææ* and *Phyllanthi*, that I had gathered when I visited this island in 1818, were scarcely to be traced at this season; whilst *Grevillea agrifolia* furnished me with duplicate seeds. The *Metrosideros* of Port Keats and Lacrosse Island covers the more elevated parts, without however any signs of fructification. I descended to the opposite sandy shores of the island, where I detected a few more bulbs of *Crinum angustifolium*, (?) and finding its shores clothed with *Casuarina equisetifolia*, and *Hibiscus tiliaceus*, the retreat of a beautiful species of *Cimex*, I returned by a different route to the boat."

They afterwards touched at Montague Sound, Capstan Island, and York Sound. Among the plants more particularly mentioned or collected there, are *Grevillea carduifolia*, *G. mimosoides*, *G. heterophylla*, *Boronia filicifolia*, *Justicia, sp.*, *Solanum pectinatum*, *Tournefortia* (a third indigenous species allied to *T. hirsutissima*, Sw.,) a very rare plant, *Loranthus acacioides*, *Acacia leucophæa*, *A. translucens*, *A. tetraptera*, *A. sericata*, *A. delibrata*, *Amyris sp.*, same as seen on South Goulburn Island, *Cassia sp.* scarcely distinct from *C. fœtida*, Linn., and *Tephrosia sp.*, a large robust tree, frequent among rocky chasms, proved to be *Tristania macrophylla*. Among other plants found at York Sound, was a species of *Callitris* crowning the cliffs with its pyramidal picturesque form, *Myristica insipida*, *Cryptocarya triplinervis*, with the *Abroma fastuosa* of New South Wales and the Moluccas, bearing flowers on the naked aculeated branches. At this period, a leak in the vessel caused such serious apprehension, as to render it absolutely imperative to look out for a secure harbour, where the cutter's bottom could be examined, and her defects repaired. A situation was happily found in Port Nelson; and, in a bay, afterwards called, from the circumstance, Careening Bay, the necessary repairs were accomplished. The refitting the cutter caused a detention at Careening Bay of nearly three weeks, which time was turned to good account by our botanist, who made extensive excursions in the vicinity of the Bay, the results of which I again extract from his journal.

"Towards the close of the afternoon, I landed with Captain King, and found that the hills bounding the beach had been recently fired by the natives, whose old temporary huts were standing on the sands. I traced two gullies that come down to the beach from the hills, and was gratified with the pleasing diversity in the botany of the small trees and undershrubs that shadowed the rocky edges of these water channels. They were of the following genera: *Bauhinia sp.* (appears distinct from *B. microphylla*), *Inga sp.*, *Santalum sp.*, abundantly in flower and fruit, *Vitex sp.* (allied to *V. glabrata*), an apparent species of *Tristania*, of arborescent growth; while *Trichinium macrocephalum* and *Spinifex hirsutus* were very frequent on the sands above the beach. We were fortunate in our discovery of pools of fresh water at the base of one of the gullies, whose grooved appearance fully declared the torrents that pass through it in the rainy season. As far as we advanced up this gully, we found small detached holes of fresh clear water, of an excellent quality, that appeared to be draining from one pool to another below, passing through luxuriantly green patches of grass, at once pleasing to the eye, and affording food on those barren shores to the kangaroo, whose usual appearances were observed on the rocks. In these humid situations, I gathered specimens of *Convolvulus quadrivalvis*, and *Senecio sp.* Two species of *Capparis* abound in the brushes, of the same kind as those seen at Vansittart Bay last year; the arborescent gouty species of this genus, (*Capparis gibbosa*, A. Cunn.,) which was first observed on the shores of Cambridge Gulf, is frequent here, growing to an enormous size, and laden with large fruit. I measured the stem of one very remarkable tree of this species, and found it near twenty-eight feet in circumference, and scarcely twenty-five feet high. Some of the trees were in the earlier stages of vernation, the extremities of the naked branches appearing green, and one that I opened exhibited the character of *folia quinata*. The usual Proteaceous plants, *Hakea arborescens*, and *Grevillea mimosoides*, were remarked on the hills, bearing fruit; where also we noticed a species of *Cycas*, in clumps. In tracing the water-gully between the hills, I gathered a few specimens, chiefly in situations extremely rocky and somewhat shaded. *Centunculus polygonoides*, *Pittosporeæ*, a large round bushy shrub, having the habit of *Bursaria*, with the fruit of *Pittosporum*, covered with a close tomentum. On a small grassy patch that had escaped the ravages of the flames, I observed a fine pinnated-leaved *Acacia* (*A. suberosa*), found in an imperfect state last year at Encounter Cove, Vansittart's Bay. It bore pods which yielded some good seeds. A tree, of the natural family *Urticeæ*, related to *Antidesma*, afforded me flowering specimens; *Sersalisia obovata* of Endeavour River, was remarked among the rocks, bearing neither flowers nor fruit. *Acacia stigmataphylla* forms brushes, clothing the declivities, having generally the last year's pods; an *Aspara-*

gus, probably *A. fasciculatus*, rambled over the tops of the small clumps of undershrubs, forming a formidable barrier, with some aculeated species of *Capparis*, and *Parsonsia velutina*.

"Early this morning (September 25th), I took my departure for the day from our encampment, on an excursion inland, with Mr Hunter our surgeon, striking southerly towards the river-like water (subsequently called Rothsay water), seen from the hills above us by that gentleman yesterday. Upon passing the ridges above the tents, we shaped our course south towards the inland water seen from the hills, whence an extensive view of the country to the southward and eastward presented us with a succession of undulated hummocky land, as far as the eye could reach, till the view was lost in the distance. The face of the country assumed an unusually sterile aspect, which was in some measure heightened by its starved vegetation having been recently destroyed by fire, which was still raging on the slopes of some hills in the distance. We passed several ridges and dividing valleys, blackened with fire, exceedingly rocky and difficult to the traveller, till we had reached the summit of a flat-topped hill, whose bluff face to the southward overhung the waters of our new river, which has a very flattering appearance, trending away to the S.S.E., bounded by remarkably elevated land, which we supposed to furnish considerable aids to its stream. The starved trees and other plants of these hills, are exactly of the same description as those frequently observed on the coast, *Cycas angulata*, however, appearing the more general form; large groups bearing young fruit, and the male plants having the last year's amenta. *Grevillea mimosoides* had produced its flowers, and would have furnished me with desirable specimens in that state, had I preceded the raging flames, which were so recent as to be still smoking where any dry sapless stump happened to be fully kindled. The stones with which the country is very thickly studded, are chiefly of a hardened sandstone, containing iron; also very fine fragments of quartz, of which some were remarkably pure. From the eminence on which we stood, several important bearings were taken, that would prove useful to the future survey of the water before us; which appeared to have its embouchure on the coast, at a supposed bay to the S.W. of the one in which we are now detained; and we observed a tolerably clear channel trending in that direction, although some ramifications were remarked to terminate in shoally flats, clothed with mangroves; and in one part a low island occupies a portion of its breadth, which is thereby materially contracted. Upon looking to the W.S.W. over the hills bounding the coast, a considerable archipelago (formed of small sand-banks or islets), invests these shores yet to be examined; and very elevated land was distinguished in that direction at a considerable distance, barely perceptible on the horizon. Large columns of black smoke arose from vivid flames upon the distant inland hills; proofs of the continued devastation going on, although perhaps not of the actual presence of natives at the particular parts whence the smoke arose. We saw no quadruped, and only the usual indications of kangaroos; of birds a few were remarked on the wing, chiefly, however, of the pigeon-family. We were not fortunate enough to discover the least portions of fresh water, either stagnant or running; but several well-worn stony gullies that intersected our course, having their descents to the westward, suggested to us the direction in which the waters, falling on the neighbouring hills during the rainy season, make their exit. About noon, having satisfied ourselves of the existence of a small inland water and its trendings; and finding nothing interesting in a country over whose surface the flames were raging in every direction, we prepared to return to our encampment, distant about six miles N. by W., by a less difficult route, which enabled us to reach our destination in a period of three hours' hard walking, and without adding a single specimen to my collections, excepting an imperfect one of the family of *Caryophyllæ.* On the 27th, I visited a part of the hills that had not been fired, where I gathered these specimens—*Chionanthus axillaris* of the east coast, a tree fifteen feet high, bearing ripe fruit, *Cæsalpinea sp.*, *Metrosideros sp.*, *Hibiscus sp.*, and *Acacia stigmatophylla.* *Grevillea mimosoides* very generally bore its viscid green fruit; and some specimens that were sixteen feet high, still had old flower-spikes. In returning along the rocky eastern shore of our little bay, I remarked the picturesque *Pandanus pedunculatus*, heavily laden with ripe fruit, of which I gathered an ample supply. This genus is not confined to intertropical climates. I have heard of its existence a few miles north of the Coal (Hunter's) River, near Port Stephens, whence some fruit had been brought to Port Jackson, which was shown me, and I have seen the plant at Port Macquarie in lat. 31°, and about 28° to the eastward of this part of the coast. This plant, therefore, has a wide diffusion through all parallels and meridians between these given points; it is most probably, however, confined (as I suspect the locality of *Araucaria** *excelsa* is) to the sea-coast. Among the brushes, chiefly of *Capparis sepiaria ?* I found a reclining slender shrub without fructification, which I suspect, from its peculiar habit, and apparent axillary umbellate inflorescence, to be another species of *Capparis.* I saw no traces of natives of recent appearance, either on the hills or on the western shores of the bay. In my return I secured a curious *Lizard*,† of extraordinary appearance, which had perched itself on the stem of a decayed tree. Four kinds of *Snakes* have been observed on the shores of the bay; and although this period (September), may be considered little other than the commencement of spring or close of winter, we are remarking new insects and reptiles, creeping out of their dormitories daily. It may, however, be inferred, that were we to visit this part of the coast during the summer months, (December to May,) a great variety of subjects in Natural History, particularly of the above families, would show themselves." Bat Island, at the entrance of Port Nelson, afforded our botanist another rich harvest, as also did the shores of Brunswick Bay, the general character of its vegetation resembling greatly that of Careening Bay.

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* *Araucaria Cunninghamia.* Mr Cunningham at this time was not aware of the specific difference of the Norfolk Island tree, and the one seen on the eastern shores of New Holland.

† *Chlamydosaurus Kingii*, Gray.—King's Survey of the Coast of Australia, Vol. ii. App. B. Reptilia, p. 424.

Notwithstanding the repairs the cutter had undergone, it was discovered that she was unfortunately not in a condition to stand any very rough weather, and from the quantity of water she made, and the near approach of the change of the monsoon, Captain King was reluctantly compelled to give up any further investigation of the north-west coast at this period. In consequence of this determination, they took leave of the coast on the 14th of October, and on the 19th of December, they once more dropped anchor in Sydney Cove, having a very narrow escape from shipwreck in a violent gale that compelled them to take shelter in Botany Bay, after an almost miraculous deliverance from being driven on the rocks (which were only discovered by flashes of lightning), at Cape Banks, its northern head.

On Mr Cunningham's arrival in Sydney, he was made acquainted with the death of his patron, that beneficent promoter of science, the late lamented Sir Joseph Banks. To Mr Cunningham this intelligence proved a severe shock; for he had ever received from Sir Joseph the most flattering commendations for the results of his past labours, accompanied by warm assurances of his future countenance and friendship. Of this painful event, Mr Cunningham thus writes—"The announcement of the lamented demise of Sir Joseph Banks, after a rapid decline of health, appeared in the *Sydney Gazette;* and on the confirmation of it by letters from England, I immediately put on that outward garb of sorrow, which at best is but a poor indication of that heartfelt grief I even now feel for the loss we have all sustained in the departure of so firm, so excellent, and invaluable a friend. I could have rejoiced to have again seen the cheering countenance of this great Mæcenas; however, viewing the advanced and well-ripened age to which this illustrious person had arrived, with the infirmities attendant thereon, and the probably distant year of my return to my native country there, to enjoy the afternoon of my life, (a period I occasionally contemplate,) I scarcely could for a moment hope for such a gratification. I duly received his last letter, (of date the 14th April, 1820;) it was short and explicit, and to me highly gratifying—fully approving of my conduct in this country, and reporting that the various journeyings of the last six years of an active life have eventually added something to the brilliancy of the garden of our Sovereign. I am particular in preserving all the letters of my superiors; but this I shall guard as I would the essential points of the religion in which I have been educated: it is the word of a dying nobleman, whose liberality had fallen alike on the just and unjust, whose kindnesses none of us can any more experience; and if, from a sight of it, I can from time to time call up the courteous spirit of its illustrious writer, to regulate my own frame of mind in the "jostlings of the world," literally I shall be a happy man.*

On a previous occasion Sir Joseph Banks evinced that kindness of heart and friendship for his protegé, in a much more efficient manner. Governor Macquarie became possessed of a copy of a letter from Mr Cunningham to Sir Joseph Banks, (presumed to be surreptitiously taken by a convict servant of Mr Cunningham's, who thought it would facilitate his emancipation by making friends at head-quarters,) in which he had complained (and most justifiably,) of the very indifferent cases for packing his collections in that were furnished to him from the lumber yard in Sydney; and also of the very trifling assistance he received from the colonial government officers in the furtherance of his pursuits, together with the consequent entailment of heavy expenses on his various expeditions. Governor Macquarie, in a personal interview with Mr Cunningham, accused him of writing to Sir Joseph Banks, making charges against him (Governor Macquarie,) and behaved in a manner that convinced Mr Cunningham that a communication would be made to Sir Joseph Banks on the subject. Mr Cunningham wrote a plain statement of the facts to Sir Joseph Banks; Governor Macquarie also addressed him, as Mr Cunningham had anticipated, and, in answer to Mr Cunningham's letter, Sir Joseph Banks writes thus:—"I have received, as you told me I should, a letter from Governor Macquarie, very improperly finding fault with you for complaining of his treatment. I have answered it by telling him that nothing in your letter to me bore the shape of a complaint; and that it was your duty, agreeably to your instructions, to inform me what proportion of assistance you should receive from the constituted authorities of the colony; that Bowie had done the same thing, and that he had represented the assistance received from Lord Charles Somerset, the governor, as very considerable, he having furnished Bowie with the loan of a waggon and bullocks for his journey, by which at least £200 would be spared from his expenses. I hope and trust that my letter will induce him to give you more encouragement than he has done; if not you will recollect that he is soon to come home, and is likely to be replaced by a more scientific governor. The voyage you are now engaged in, which will have been completed ere you receive this letter, promises in my judgment the most interesting discoveries to you; it will be particularly interesting, as it is not likely the north-west country should be soon visited again, so that the sole credit of all the new plants you obtain, will be entirely your own. May the success that your talents, your industry, and your activity deserve, always attend you, is the sincere wish of

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* The following is the letter mentioned with such unmingled praise:—

SOHO SQUARE, 14*th April*, 1820.

MR CUNNINGHAM,

SIR,—I have received safe and in good condition the numerous things you have sent me, and the Royal Gardens have materially benefited by what we have had from you. I give you great credit for having the second time volunteered to go with Captain King to the north coast, we could have no account of the plants he meets with from any other quarter. I trust and hope, however, you will not be called away any more, but will be able to attend to the inland excursions made from Sydney. I write you a short letter, because I am not well. I know of nothing more to say to you, than that I entirely approve of the whole of your conduct, as does also our worthy friend, Aiton at Kew.

Your sure Friend,
(Signed) JOS. BANKS.

To Mr A. Cunningham, Botanical Collector
to His Majesty, George IV.

"Your assured good friend,
"JOSEPH BANKS.
"To Mr Allan Cunningham. "*August*, 1818."

The Mermaid having been condemned, as not sea-worthy, a vessel called the Haldane, an India teak-built brig, of 170 tons, was purchased by the colonial government for the fulfilment of the survey. Her name, on entering His Majesty's service, was changed to the Bathurst; and by her larger size, and greater accommodations, she afforded the voyagers much more room and conveniences than the cutter had done.

After various delays, the Bathurst sailed from Port-Jackson on the 26th of May, 1821, in company with the Dick merchant-vessel bound to Batavia. The first place touched at on this their fourth voyage, was one of the Percy isles, the summits of which were crowned with stunted *Araucaria* (*A. Cunninghamia*); the plants generally were the same as those collected two years previously on one of the other islands of the same group. On the 18th of June, they landed at Cape Grafton, the botany of which produced many interesting plants to our collector, who says,—"I could not but observe the extreme luxuriance of the plants on the north and north-western sides of the hills immediately connected with the ridge forming Cape Grafton, where the vegetation is affected very slightly by a tropical sun, and where a continued humidity in a mild atmosphere had induced a most exuberant growth in the plants. The larger blocks of granite that were detached from the solid mass of the range, and had found a lodgment in the abrupt declivities, were literally overwhelmed with the richest vegetation." Landings were also made at Lizard Island, Cape Flinders, Clark's Island, in which island Mr Cunningham discovered on the sides and roof of some weather-worn caves, several curious drawings by the natives; representing tolerable figures of sharks, porpoises, turtles, lizards, &c., they were executed upon a ground of red ochre (rubbed on the black schistus rock), and were delineated by dots of white argillaceous earth. The islands touched at on the north coast, viz., Goulburn Island, Sims' Island, &c., all appeared to be suffering from extreme drought. Their consort, the ship Dick, parted with them on the 9th of July for Calcutta, and the Bathurst continued her course to the westward. Careening Bay was revisited on the 23d, in the hopes of obtaining a supply of water; but the drought within the tropics appeared universal; for although there was a luxuriant growth of vegetation which would seem to indicate no lack of rain, still fresh water was not to be found in any of the places where last year it had been abundant; and Captain King removed his vessel to the Prince Regent's River to take in a supply from thence. Mr Cunningham, at this period, was attacked with ulcerated sore throat, which placed him most unwillingly on the sick list. During his indisposition, which precluded his leaving the vessel, Captain King and his officers, on all occasions when on shore, made collections of such plants that fell in their way for the benefit of the invalid, who also always despatched his servant with a vasculum to accompany the shore-going boats, whereby the productions of the coast were not entirely lost. The labour of obtaining water at the Prince Regent's River being very great, Captain King left his anchorage there on the 6th of August, and proceeded to Hanover Bay, where he had not much more success. They continued on the coast, with but very few opportunities occurring for landing on its shores, till the 26th of August, on which day they made sail for the Mauritius to refit, and on the 26th of September, they anchored in Port Louis. Mr Cunningham, whose health was very indifferent, having at this period symptoms of a disordered liver, made the best use of his time, as far as his debilitated state of health would permit, in visiting such parts of the island as were accessible to him, as well as the Botanic Garden at Pamplemouse, of which he speaks in the following terms:—"It is about seven miles from Port Louis, and is very extensive, occupying a spot of about forty acres. I saw there with much pleasure very many rare exotics from India, Africa, Madagascar, &c., among which were *Tanæcium pinnatum*, Wall., thirty feet high, having racemes two feet long of red flowers, two species of *Myristica*, *Agathophyllum aromaticum*, Will., *Barringtonia speciosa*, *Ficus elastica*, *Artocarpus incisa*, *A. integrifolia*, *Garcinia celebica*, *Caryophyllus aromaticus*, *Eugenia malaccensis*, *E. Jambos*, *Tectona grandis*, *Semecarpus anacardium*, *Hymenæa verrucosa*, *Calophyllum Calaba*, *Pandanus* four species, *Spondias mangifera*, Will., and in Palms the garden is very rich. *Sagus Ruffii*, *Areca Catechu*, *A. alba*, *A. madagascarensis*, *Lodoicea maldavica*, Lab., with several others not known." Having completed their supplies, the Bathurst sailed from Port Louis on the 15th November, and anchored in King George's Sound on the 23d December. Mr Cunningham's health, during their stay at the Mauritius, had been far from good, and on their departure he was compelled to place himself once more on the doctor's list. He says, "The general debility of body, deranged liver, and particularly soreness of my throat, under which I had laboured during the whole of our stay at the Isle of France, obliged me upon leaving that colony to submit to a course of mercury. I have therefore been wholly under the care of our surgeon till the evening of the 22d (December), when I was discharged from his list, although somewhat debilitated with the severity of the attack upon my liver, as well from the abstemious strictly low regimen as from the medicines used to bring about my cure. It has therefore afforded me subject-matter of joy to be again restored to health, just at the moment (upon our return to the coast of New Holland,) when opportunities call forth my utmost industry, upon shores abundantly rich in the most valuable and important stores that Flora has to present me. On the afternoon of the 24th, I landed with Captain King on the beach, where our tents had been pitched four years since, and was much surprised at the change of the vegetable kingdom on that shore: we could discover no trace of the garden which I had formerly with much labour made; the breadth of the beach had considerably diminished, by a great accumulation of decayed sea-weed and other vegetable matter; and the stumps of large trees (two feet diameter), cut down in 1818, were wholly concealed from our view by the luxuriant stems that had again grown out of them, exhibiting with every shrub around, the most luxuriant growth of vegetation conceivable. On the side of the wooded hill above the beach, I remarked almost every plant to be in a much more backward state than observed in January, 1818, the season on the whole being more favourable for flowering specimens than for ripened seeds. *Banksia grandis* and *B. coccinea*, the pride of the Sound, were extremely fine in flower, as were also several *Leptospermæ;* and among the variety around, I gathered the following as a commencement:—*Calytrix truncata*, a shrub with white flowers, wanting the setæ that terminate the divisions of the calyx in this genus; *Lysinema ciliatum Comesperma, flavescens*, allied to *C. conferta*, Lab., *Hakea ceratophylla, H. florida, Opercularia vaginata, Johnsonia lupulina*, a curious plant of *Asphodeleæ, Gastrolobium lanceolatum, Melaleuca thymoides*, Lab., *Petrophila rigida, Conostylis aculeata, Acacia decipiens, A. nigricans.* Nothing could possibly exceed the beauty of *Pimelea decussata* on rocks nearly washed by the sea, where *Scævola nitida* was also frequent. *Dasypogon bromeliifolius* had perfected its young fruit: its seeds, however, were in no specimens examined ripe; as was the case with *Anigozanthus*, and those specimens of *Patersonia* I found on these shores.

"*Dec. 25th.*—Upon the lower slopes I gathered fruit of *Banksia attenuata* in excellent condition, as also of *B. grandis*, with *Dryandra formosa* and *D. tenuifolia.* In an elevated rushy bog, I detected the following plants in flower:—*Cosmelia* *rubra*, a very interesting plant of *Epacrideæ*, *Pimelea angustifolia*, with *Pleurandra purpuracea*. Upon the exposed, gravelly ridges, I gathered specimens of *Leptomeria aphylla* and *L. squamulosa*, *Leucopogon gracilis*, *L. tamariscinus* and *L. propinquus*, *Daviesia physodes*, *Tetratheca glandulosa*, Lab., *Boronia cuneata*, a slender plant allied to *B. pilonema*, Lab., *Synaphea polymorpha*, a curious genus of *Proteaceæ*, and an umbelliferous shrubby plant, very frequent beneath the shade of trees, perhaps of the proposed genus *Leucolæna* of Mr Brown (*Xanthosia*, Rudge). Some delicate *Stylideæ* were discovered among gramineous plants, where also I detected *Conostylis setigera* in flower. *Patersonia lanata* sparingly bore its flowers; but their fugacity would not allow me the opportunity of conveying expanded flowers on board for examination. Some species of *Hæmodorum* were shooting forth their lurid brown flowering stems; but none were remarked bearing flowers fully developed. The summit of the ridge was wholly uninteresting, being chiefly stunted *Eucalypti*, *Banksia grandis* advancing to flower, and the arborescent *Xanthorrhæa* of the shores. Agreeing in habit, and producing a stem similar to this last-mentioned species, exists a plant* on these hills, whose fructification has never been detected in a perfect condition for examination. Of the many specimens I passed this morning, all bore the very decayed last year's scapes, or bracteated spikes, with no appearance of a disposition to flower again; and indeed even in a worse condition than remarked in January, 1818, when it was my opinion that the plant has expanded flowers in April or May, and ripe fruit the following September. Any vessel, therefore, touching on these shores in the winter season, might assuredly find this most remarkable and unknown plant in an interesting and very important state of flower or fruit. Having traced the narrow ridge of the highest hill above the anchorage in a northerly direction, I descended upon the eastern shore of Oyster harbour, and in passing through a shaded forest land, I was furnished by reason of the shade, with a pleasing change in the vegetation, viz., *Daviesia cordata*, and *D. juncea*, *Chorizema berberifolia*, *Bossiæa linophylla*, *Logania longifolia*, *Gompholobium heterophyllum*, *G. capitatum*, and two species of *Kennedya*. In these shaded situations *Anigozanthus flavida* and *Hæmodorum spicatum* were of very strong growth, with *Viminaria denudata*, *Lasiopetalum purpureum*, which grows in large brushes, afforded me ripe seed; but I was not successful in procuring fruit of *Hakea amplexicaulis*, frequent in these situations.—December 26th. In this day's walk I gathered the following—*Dryandra blechnifolia*, with however only decayed fructifications, whilst others of this natural family afforded me perfect specimens, *Synaphea dilitata*, *Isopogon teretifolius*, *Anadenia pulchella*, and *Dryandra plumosa*, also *Astroloma pallidum*, *Lysinema conspicuum*, *Leucopogon verticillatus*, a tall shrub, bearing white fruit, and *L. carinatus*, *Grevillea sp.*, a weak sub-procumbent shrub allied to but scarcely *G. occidentalis*, *Anadenia trifida*, *Casuarina sp.*, a shrub of low stature bearing fruit. Of the natural family *Asphodeleæ*, *Cæsia corymbosa* afforded me seed and flowering specimens, as did also *Tricoryne tenella*, with an *Arthropodium*, apparently in no wise distinct from *A. fimbriatum*. Seemingly of the related family of *Melanthaceæ*, and allied to *Burchardia* of Port Jackson, in the capsule and testa of the seed, I detected a plant bearing ripe fruit. A showy *Gompholobium*, with linear ternate leaves and numerous ascending stems decorates these woods with its unproportionately large flowers, and is frequent with another plant that may probably be *Burtonia*, R. Br. The large white flowers of *Scævola striata* bespangled the arid brushy declivities of the hills, and with a smaller species, *S. pedunculata*, furnished me with specimens. Thickets of *Logania longifolia* were in flower and young fruit, under whose shade grew its congener *L. serpyllifolia*. Passing through matted brushwood of common plants, bound together with *Cassytha pubescens*, we at length reached the summit of the ridge, where I detected an undescribed genus of *Rutaceæ*, with a coloured plumose fimbriated calyx, being a second species of a genus gathered last year on the north-west coast, *(Anthoderris)*; also *Leucopogon alternifolius*, and *L. cucullatus*, *Hakea undulata*, and *H. trifurcata*, the latter a large compact shrub, difficult to detect in fruit, owing to the similarity of its capsules to one form of its leaves. *A. Dodonæa*, with remarkably acute alæ to the fruit, supplied me with good seeds. With a view of avoiding the natives, whom we perceived strolling between their general encampment and the vessel, we kept the leading ridge of the hills, from which we had a fine view of the distant country west of Oyster harbour. By a circuitous route back, we at length arrived at an elevated spongy bog, the drainings of which having collected between the shoulders of the higher land, and formed a purling rill, I was desirous of tracing it to its exit on the beach, with a view of making some discovery likely to be useful to our commander in completing his stock of fresh water. In this bog I found the curious *Cephalotus follicularis*, a pitcher plant of very weak young growth, and without fructification."*

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* *Kingia australis*, R. Br. For description and figure, vide King's Survey of the Coast of Australia, Vol. II. App. B. Botany, p. 534 ; also Flinders' Voyage to Terra Australis, Vol. II. App,, p. 576.

During the remainder of their stay at King George's Sound, Mr Cunningham landed daily, and made great accessions to his collection of specimens and seeds. They sailed from King George's Sound on the 8th of January, 1822, and recommenced their survey at Bathurst Island, where they arrived on the 13th. Mr Cunningham remarks, that "It is surprising that an island at so short a distance from the south-west coast should bear so small a feature of the characteristic vegetation of King George's Sound, as not to furnish a single plant of the several genera of *Proteaceæ* or *Acaciæ*, and but a solitary plant of *Leguminosæ*, *Templetonia retusa*." On the 21st, they anchored off Dirk Hartog's island, of whose sterility Mr Cunningham says—"Perhaps no part of the coast we have visited can possibly exceed this island, considering its extent, for its barren parched appearance; for, upon the shores near us downs of sand of very considerable surface appeared rising to a ridge perhaps 200 feet high, in most parts extremely bare of vegetation, and those portions which were covered seemed to be burnt up with the heat of the sun. In a walk of two hours I gathered the following plants:—*Beaufortia Dampieri*, A. Cunn., *Artemisia sp.*, *Westringia cinerea*, *Sida sp.*, *Euphorbia eremophila*, *Sapindaceæ*, a shrub frequent in low brush-wood, *Trichinium incanum*, (discovered by Dampier,) *Gomphrena sp.*, a diffuse plant, past flowering, but bearing seed, *Hibiscus capræodorus*, *Podolepis tenera*, and a shrub of *Rutaceæ*, seemingly *Diplolæna* of Mr Brown, originally discovered and figured by Dampier, and a curious procumbent plant of *Capparidæ*." They sailed from Dirk Hartog's island on the 26th, and continued their survey of this peculiarly arid sandy coast under most unfavourable weather. While in Cygnet bay, Mr Cunningham had a narrow escape off a point that bears his name: he had gone with an officer in the second cutter, in hopes of landing and adding something to his collections, when a gale sprung up that nearly swamped their small vessel, and they had great difficulty in rejoining the Bathurst, whose cable had parted during the gale. On the 20th of February, when there being no appearance of a cessation of bad weather, and their provisions also running low, Captain King was unwillingly compelled to take his departure from the coast, and after a somewhat tedious passage, arrived in Sydney Cove on the 25th April. Thus terminated Mr Cunningham's four years' voyages with Captain King, in which the botany of a large portion of the coasts of New Holland were investigated, and many remarkable forms detected. Among others may be noticed eight new species of that interesting genus *Grevillea*, from the north and north-west coasts*—the only genus of *Proteaceæ* that is abundant in tropical New Holland. For a general detail of the botanical results of these voyages, the reader is referred to Mr Cunningham's observations in the appendix to Captain King's survey of the coasts of Australia, entitled, *A few General Remarks on the Vegetation of certain Coasts of Terra Australis, and more especially of its north-western shores. By Mr Allan Cunningham, Collector to the Royal Gardens at Kew.* Mr Cunningham separated from his commander (who was ordered to England,) with much regret; for Captain King's kind attentions to the botanical pursuits of his *compagnon de voyage,* in addition to their four years' close connexion on shipboard, had cemented a friendship that was only dissolved by the untimely death of the subject of this memoir.

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* *Vide* King's Survey of Australia, v. II. p. 154.

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* Supplementum primum Prodromi Floræ Novæ Hollandiæ, Robertus Brown, 1830, p. 17.

In the month of August, Mr Cunningham made a second excursion to Illawarra, for the purpose of collecting living plants of interesting species that he had observed on his previous visit; these, with some seeds in addition to his collections on his fourth voyage, were forwarded to England at the close of the year. Mr Cunningham having made application to the new governor, Sir T. Brisbane, for more efficient means to enable him to make excursions to the westward of the colony, a cart and horses with government servants were allowed him for this especial purpose; and towards the end of the month of September, he started on an expedition over the Blue mountains, with a light cart, two horses, and two government servants. He proceeded leisurely on his journey, encamping at those places that appeared most favourable for his botanical pursuits, particularly the Prince Regent's Glen, and the banks of Cox's River, and the Fish River; he arrived at Bathurst on the 14th October, and found that place much improved and enlarged since his visit in August 1817, when returning from the expedition to the Lachlan. The woody glens that conduct numerous rivulets to the Macquarie afforded him a rich harvest; the country to the north, as far as the government lime-kiln and the Wombat ranges, were also visited. On the 18th November, Mr Cunningham, having obtained an additional convict-servant from the commandant at Bathurst, set off on an expedition to the northward, with the intention of travelling some distance down the Cugeegong River; but at an early stage of his journey, one of his packhorses having broken from its tether-rope in the night, being alarmed by the fall of a large tree in the adjoining forest which was on fire, he was precluded going to that extent he had originally intended, and much time was expended in searching for the lost animal, for his remaining horse could not convey the necessary provisions and baggage of the party. The time however was not wholly lost; for our botanist made excursions in the vicinity of his encampment, that possibly repaid him as well as if he had been enabled to reach the farthest point of his projected journey. He visited Mount Stirling, Earin's Head, Table Bucco Flat, and places at a short distance from his encampment, most of which afforded him an interesting addition to his previous collections. The botanical acquisitions of his journey are detailed at length in a paper, entitled, *A Specimen of the Indigenous Botany of the mountainous country between the colony round Port Jackson, and the settlement of Bathurst, being a portion of the result of Observations made in the months of October, November, and December,* 1822*; disposed according to the Natural Orders, by Mr Allan Cunningham, Botanical Collector for his Majesty's Gardens at Kew.** The party returned to Paramatta, on the 4th of January, 1823.

Mr Cunningham now contemplated a much more extended journey: the observations made in his late tour afforded him considerable hopes of penetrating from Bathurst northerly, towards the then but little known Liverpool plains, and of opening a communication with that district, which would be the means of giving to the rapid tide of emigrants that were now flocking to New South Wales, a new and untrodden country for them to exert their agricultural abilities upon. On communicating with the governor, Sir T. Brisbane, relative to his projected journey, he was most warmly met and cordially assisted in the furtherance of his purpose. Sir T. Brisbane, who had a short time previously visited Bathurst and its immediate neighbourhood, instantly saw the great advantage that would result to the colony, if easy access could be attained to the vast plains discovered by Mr Oxley on his return from his unsuccessful descent of the Macquarie in 1818; and consequently gave orders for the equipment of this new exploratory expedition to the full extent of Mr Cunningham's requisitions. On the 31st of March, the party, which consisted of Mr Cunningham and five men, and five heavily laden packhorses with provisions for ten weeks, left Paramatta for Bathurst, where they arrived on the 5th of April; and on the 15th, they took their departure from that station for the ultimate object of their journey. The finding a practicable passage through the mountains that form the southern boundary of Liverpool plains proved a most toilsome and laborious experiment; for, after a journey of a fortnight along the southern face of these mountains, on an easterly course, without any appearance of an available opening in them, Mr Cunningham returned to the westward, on a more southerly course, and struck his previous encampment on the Goulburn River again, on the 31st of May. Although his horses were considerably reduced in strength, and his provisions were running short, by reducing the rations which gave him a little more time, he determined on pushing forward north-westerly for a short period; and at length, on the 5th of June, he was rewarded for his toils and anxieties by the discovery of a practicable opening in the mountains, that afforded him the means of descending to the long-sought Liverpool plains, and which he most appropriately called Pandora's Pass, from the *hope* it gave him of its ultimately becoming the great route of communication between the settlers at Bathurst and on Hunter's River, and the future inhabitants of Liverpool plains. The latitude of his tent in the valley immediately below the Pass, was 31° 43′ 45″ S., and longitude by estimation 149° 30′ E. Under a tree in the valley was deposited a memorandum written on parchment, and enclosed in a bottle: the following is a copy of the document.

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* Geographical Memoirs on New South Wales, by various hands. Edited by Barron Field, Esq., F.L.S., &c., &c., 8vo. 1825, p. 323.

" MEMORANDUM.

"After a very laborious and harassing journey from Bathurst, since April last, a party consisting of five persons, under the direction of Allan Cunningham, H. M. Botanist (making the sixth individual), having failed of finding a route to Liverpool plains, whilst tracing the south base of the barrier mountains (before us north), so far as fifty miles to the eastward of this spot, at length upon prosecuting their research under this great mountain-belt in a westerly direction, reached this valley, and discovered a practicable and easy passage through a low part of the mountain-belt, north by west from this tree, to the very extensive levels connected with the above-mentioned plains, of which the southernmost of the chain is distant about eleven or twelve miles (by estimation), N.N.W., from this valley, and to which a line of trees has been carefully marked; thus opening an unlimited, unbounded, seemingly well-watered country N.N.W., to call forth the exertions of the industrious agriculturist and grazier, for whose benefit the present labours of the party have been extended. This valley, which extends to the S.W. and W.S.W., has been named 'Hawksbury Vale,' and the high point of the range, bearing N.W. by W. from this tree, was called 'Mount Jenkinson;' the one a former title, and the other the family name of the noble earl whose present title the plains bear, to which from the southern country this gap affords the only passage likely to be discovered. The party in the earlier and middle stages of their expedition encountered many privations and local difficulties, of travelling to, and in their return from, the eastward; in spite however of these little evils, 'a *Hope* at the bottom,' or at this almost close of their journey, an encouragement induced them to persevere westerly a limited distance, and thus it was this passage was discovered.—It has therefore been named 'Pandora's Pass.' Due east and west by compass from this tree, in a direct line of 336 yards (by odometrical admeasurement), were planted the fresh stones of peaches brought from the colony in April last, with every good hope that their produce will one day or other afford some refreshment to the weary farmer, whilst on his route beyond the bourne of the desirable country north of Pandora's Pass: a like planting took place on the plains, twelve miles distance north at the last marked trees, with similar good wishes for their growth. A remarkably high mount above the pass east, being a guide to the traveller advancing south from the plains, has been named 'Direction Head.'—The situation of this tree is as follows: lat. observed on the 7th and 8th of June, 1823, 32° 15′ 19″ S.; its longitude being presumed about 149° 30′ E. The party now proceed with the utmost dispatch south for Bathurst.

"ALLAN CUNNINGHAM.
"*June 9th*, 1823."

"Buried for the information of the first farmer who may venture to advance so far to the northward as this vale, of whom it is requested this document may not be destroyed, but carried to the settlement of Bathurst after opening the bottle."

Mr Cunningham, having thus attained the primary object of his journey,* commenced his return southerly, and reached Bathurst on the evening of the 27th June, where he remained till the 14th of July, for the purpose of resting his men and horses, and also on account of the impracticable state of the roads from the heavy rains that had lately fallen. On the 21st, he returned to Paramatta. Although the geographical results of this journey were so valuable to the colonial government, the botanical portion of it was not so much to our collector, on account of his traversing principally luxuriant pastures, which afforded him but a few plants interesting in a botanical point of view: on this subject Mr Cunningham remarks—" Truly important as these researches of country will prove to the many British farmers who are periodically emigrating to our distant shores, the land through which I have recently penetrated has been generally so uniform in appearance—for where any deviation to barren brushy tracts existed, they presented little or no novelty to the botanical traveller—that only a small collection of dried plants have been made, the indigenous vegetation being identically of the same characters generally as that seen and collected last summer. I have, however, gathered a few papers of desirable seeds not previously found."

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* See *Field's Geographical Memoirs of New South Wales*, p. 131, for the details of this interesting journey.

A new, and as it was anticipated, a more practicable route, having been discovered over the Blue Mountains to the northward of the existing road, Mr Cunningham determined to investigate its locality, deeming it very likely to afford him some botanical rarities. At the latter end of November, he proceeded with two men and a couple of packhorses, to investigate this newly discovered pass, and from his journals I shall make occasional extracts of his proceedings:—

" November 26th. About 7 A.M., I commenced my journey from Mr Bell's farm, having passed an irregular tract of rising forest-land by a well-beaten road to a watermill, distant about four and a half miles north-westerly from Hawkesbury river, the marked trees of the surveyor (who had been sent to examine and report upon the line of route,) led us over a ridge of wooded hills to a rocky gully, which having crossed, we immediately gained a main range, bounded on either side by deep ravines. This range, which ascends in a westerly direction, is clothed with those species of *Eucalyptus*, called the Blue Gum and Iron bark of large dimensions, *Melaleuca styphelioides*, thirty feet high, *Tristania albicans*, *Acacia elata*, a tall tree forty feet high, seen also at Springwood last year—*Elæodendron australe*, *Cargillea australis*, a species of *Athero-*

sperma, called by the colonists *Sassafras*, with several shrubs of the colony, frequent in situations similarly situated. The brushes, with which the range (whose ascent was very moderate,) is exceedingly encumbered, is rendered scarcely passable by packhorses in many parts, by reason of the numerous twining plants with which they are matted together, of whom *Bignonia australis*, *Cissus antarctica*, and *Smilax australis*, were the more remarkable. As we ascended (very leisurely of necessity), we remarked several parts of this main range to be very narrow, not exceeding sixteen to twenty yards in breadth, and only in a few patches where these viney thickets cease and the forest is less encumbered with underwood, was there any grass; in general, however, the surface is covered with ferns, and, although we discovered a little water in a neighbouring gully convenient to our line of route, the necessary element to the traveller is not to be found generally, excepting in the depths of the deep ravines; *Schelhammera sp.*, and *Renealmia paniculata*, Br. were observed in the more shaded parts of the ascent. We halted about 4 P.M. at the water we had found, having made an advance of about six miles from Mr Bell's farm.

"27th. About 7 A.M. we resumed our journey westerly on the line of marked trees, which led us through a continuation of close brushy forest, abounding with much underwood of common colonial plants, the more rare being *Aster dentatus* of strong shrubby growth, *Hibbertia saligna*, and *Lissanthe sapida*. In about a mile and a half we ascended a round rising open patch of ground covered with *Lomaria procera*, *Pteris umbrosa*, *P. falcata*, and *Doodia aspera*, the timber being chiefly *Tristania albicans*, the Turpentine tree of the colonists. Immediately again the thick brushy forests bound this open, less encumbered part, and as we penetrated through it I observed some very fine specimens of *Alsophila australis*, a tree-fern fifteen to twenty feet high, *Tetranthera dealbata*, and a tree of *Urticæ*, bearing globular compound fruit, inserted within a persistent calyx. At length in about another half mile, the range has an abrupt rocky termination to the westward, which is clothed with a sandstone scrub of plants, observed generally in similar sterile situations in the colony. From this eminence, which has been named Bell's View, an extensive landscape of country is presented to the traveller, in a sweep of the compass from about south by the way of west to north. At S.S.W. and S.W., a considerable extent of moderately broken country is seen in a series of ranges beyond the old mountain-road to Bathurst, uninteresting in the picture on account of its tameness. Upon looking over a tract, broken by sharp well-wooded ravines, and irregular rocky ridges about thirty miles, I observed with pleasure an open undulated country from N.W. to N.N.W., whose feature I instantly recognised as of the same description of landscape which I had so much contemplated when on the Cugeegong river last year, and during my late tour,—this north-western tract being situated to the eastward of the Plain of Daby on that stream. The western face of this termination of the range being found too steep and precipitous to attempt its descent, the surveyor's marked trees led us along the slope of a sharp rocky ravine trending to the S.W., and thence we descended with considerable risk to our packhorses, about a quarter of a mile through much harsh scrubby brush. Our marked route westerly conducted us through a brushy and scrubby country, that might be considered nearly level—so exceedingly slight are the ascents and descents—in this stage of our journey the brush commences exceedingly dense, twelve feet and upwards in height, and composed chiefly of *Pultenæa linophylla*, *P. scabra*, *Daviesia ulicina*, and *Bursaria spinosa*, or perhaps a distinct species, formerly gathered on the Hasting's river at Port Macquarie. In several parts we found the route scarcely pervious to packhorses without the active application of our tomahawks. Having penetrated about four miles west from Bell's View, through a continuation of the brush, grass appearing tolerably plentiful, induced me to encamp on the rocky verge of a ravine, where abundance of water was found.

"28th. About 6 A.M., we quitted the spot on which we had encamped, pursuing the western route along the line of marked trees through a small portion of scrub which brought us to another *Pultenæa* brush, as lofty and compact as those we passed yesterday—a space upwards of a mile and a half being occupied by it. Occasionally the timber is stately and of regular growth, and consists of Blue gum, Stringy bark, and Turpentine trees; and in these situations where the thicket or underwood was more open and less difficult to penetrate, some patches of grass are to be met with where cattle can feed; but no water was observed to cross the marked track, being only to be sought successfully in the neighbouring gullies. The country continues very level, through which a good road could be formed with the labour simply of cutting down and eradicating the underwood and thickets, the timber being generally at such distances as not to require felling. At the 14th mile-tree a dry scrub succeeds the brushwood of the forest, where *Banksia serrata* of large size, *Lomatia silaifolia*, *Isopogon anemonifolius*, *Telopea speciosa*, *Lambertia formosa*, and several other plants of Paramatta and its vicinity were flourishing in their usual soil of decomposed sandstone. Another mile brought us into forest brushes formed of *Indigofera australis*, *Bursaria sp.*, *Daviesia ulicina*, *Acacia longifolia* bound together by *Smilax australis*, *Cissus sp.*, *Cassytha paniculata*, and *Clematis coriacea*, constituting so compact a thicket as scarcely to be passed by packhorses without great labour, and by many circuitous digressions from the surveyor's route. This brushy forest continues more or less difficult to the nineteenth mile, when having passed a stony scrub, we arrived at a range of broken country observed from Bell's View. Tracing the marked route, we ascended the side of the mountain through much fallen timber, large rocks concealed by luxuriant ferns, and much brush—we with great exertion to our packhorses gained the summit, when having passed just within the verge of the dark lofty forests which clothe its higher parts, we encamped on the spot where the Surveyor's party had rested, finding water of a tolerable quality in a neighbouring gully. The summit of this mountain is named by the aborigines, Tomah, and is distant from the Hawkesbury ford, at Richmond, twenty miles. Upon entering the forest, the traveller is struck with the change of appearance of the timbers from the *Eucalypti* of the open country, the stupendous size and extraordinary windings of the climbers, particularly a *Cissus*, and with the magnificence of the tree-ferns, *Dicksonia antartica*, some of which were thirty feet in height, and six to fourteen inches in diameter. In truth all that striking change to tropical scenery meets the eye, which appears so remarkable at the 'mountain top', above the Five Islands (Illawarra.) Amidst a diversity of plants, and great variety of cryptogamous botany, we had to regret there was no grass for our exhausted pack-horses; however, among the ferns which everywhere covered the surface of the ground, a species of *Senecio* was sparingly scattered, upon whose heads they were observed to browse.

" 29*th*. It was my intention to have spent a whole day at this encampment, in order to examine the summit of Tomah—the consideration, however, that it afforded my horses no grass, determined me to proceed forward early in the afternoon, some four or five miles to the westward, where we had been informed some little pasture existed. The timbers of the forest, as far as I could ascertain them, were two lofty species of *Eucalyptus*, one called White Gum, *Ceratopetalum apetalum?* (I have not the fruit,) *Achras australis*, *Tristania albicans*, *Olea paniculata*, *Elæodendron australe*—and by far the more general tree, growing 60—70 feet in height, is a species of *Atherosperma* (Sassafras.) Twining and climbing plants of vast strength and magnitude hang from the heads of the loftiest trees, and bore upon their pliant stems abundance of climbing *Polypodia*, and tufts of a *Dendrobium*, allied to *D. rigidum*. Another plant of this beautiful family, rarely to be met with in the colony, I observed in flower sparingly—it was *Sarcochilus falcatus*, of which I also gathered a few living specimens. Hanging in attenuated clusters from the highest branches of the trees, I detected a third species of this family, and probably a *Dendrobium*, not apparently noticed by Mr Brown.

Its leaves are from eight to twelve inches long, perfectly cylindrical and attenuated at each extremity—these were inserted upon long slender almost filiform stems, the whole being supported by strong thick roots which adhere firmly to the branches of the trees, from whence these plants swing in the breeze perfectly unencumbered and clear of the stems. A climbing rooting-stemmed plant adhering to the trunks of the tree-ferns is very general in these shaded woods, where it covers also fallen timber. I was fortunate in detecting it in fruit and flower; it belongs to that division of *Bignoniaceæ*, of Jussieu, producing baccate fruit.* The *Filices* are numerous and curious,—I saw none, however, other than those species of which I had gathered specimens in 1818, at the Five Islands. The soil of these shades is a fat argillaceous loam, blended with much decomposed vegetable matter. In this earth I remarked partially buried large blocks of a compact whinstone in no regular form; and in the banks of the water-gullies, I traced abundance of slate in apparently horizontal laminæ. Fresh water percolates through the soil into these gullies everywhere, and although impregnated with iron, was of a good quality for our general purposes. About 1 P.M., we continued our route along the line of marked trees, which led us by a winding course through the darkest parts of the forest, over the mountain to its north-western declivity, about a mile and a half beyond the encamping spot we had left. Lofty densely timbered mountainous ranges now appeared before us peering over each other, lying in no regular series of order, but assuming an aspect so formidable by their perpendicular faces overhanging deep ravines, as to seem to defy all further attempt to penetrate westerly. However, we traced our way by the line of trees down the declivity, which every step became more and more dangerous, by reason of the loose fragments of sandstone and shelving rocks, which were thickly strewed on the surface. In spite of every care of my people, the heaviest laden packhorse in attempting to jump down a perpendicular fall over a rock of three feet in depth, lost his balance, and was in an instant off his legs, on the edge of a sharp brushy declivity, down which he rolled over five times before one of the saddle bags stopped his frightful, hurried descent. Every assistance was promptly afforded him, and, on being disburdened of his load, he got upon his legs evidently much shaken in the loins, but no bones fractured. The dangers of a loosely stoned track along a sharp decline of the mountains, very frequently obstructed by large trunks of fallen timber, appeared to be so considerable, as scarcely to warrant our further prosecution of the journey to Cox's River, with packhorses so heavily laden as mine were. Unwilling, however, to halt and suffer myself to be discouraged by a single accident, we continued along the slope of the mountain another half-mile, when both my wearied beasts having repeatedly fallen under their loads, and the path (if it might be so called,) becoming much more rough and dangerous by shelving rocks and fallen timber, I was obliged to halt in a rugged stony scrub on the sharp side of the mountain, it being dusk, and heavy rain had already set in for the night. Thus situated, we pitched our tent on the declivity, gave our poor beasts a little corn which we had cautiously brought with us, and frugally issued, and then secured them to trees around our fire for the night, without a blade of grass or herb to eat, the recent fires of the surveying party having passed through the brush, and destroyed every kind of vegetation.

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* *Fieldia australis*, A. Cunn. Field's New South Wales, p. 363, t. 2, fig, 4. Hook. Ex. Fl. t. 232.

"30*th.* The wind continuing from the southward and eastward, we had rain throughout the day. Some young rushes being found by one of my people on a patch of bog about half a mile westerly round the mountain, I caused the horses to be shifted to, and tethered upon it; it however benefited them nothing, since they partook but little of it.

"*Dec.* 1. The route onward westerly proving on examination much more rugged and dangerous than the paths we have passed, and as both my horses are now reduced to that state of debility as by no means to justify me in persevering further, particularly as the line of country before me (18 miles to Cox's River), has been reported by the surveyor to be of arid brushes on a sandstone base, I have been induced from necessity to proceed back to my encampment at Tomah, two and a half miles distant, where I have proposed to remain a day to afford rest to my wearied horses, a little herbage being also to be met with among the Ferns in the neighbouring open forest-land. On the whole I have not so much to regret my incapability to advance forward to Cox's River by this recently discovered route, since as already remarked, the remaining distance is a sandstone scrub with only an occasional patch of grass, and hence not likely to afford me a single plant other than what the parallel line of old road south of it furnishes; whilst, on the other hand, the mountain of Tomah, from the permanency of its shade, and general humidity of the atmosphere of its elevated summit, giving a peculiar character to its vegetation, appears every way more interesting to me in my pursuit of Flora, which has been the sole object that has induced me to take this journey.

"2d. A very high wind from the north-west during the night rendered our encampment not altogether safe, as the decayed branches of the trees, which the violence of the wind had broken off, were falling about us in every direction. My two horses having rejected every kind of herbage my present station afforded them, although frequently shifted to fresh spots, and finding they were daily becoming more debilitated for want of proper nourishing pasture, I was obliged to despatch them with a light load each to my encampment of the 27th, distant about nine miles, where there was a little grass, it appearing to me very evident, that should I continue them another day at Tomah, they would become so exceedingly exhausted as to be unable to return to Richmond with my luggage. As I continued at Tomah with the remaining portions of my baggage, until the return of one of my people with a packhorse on the morrow, I employed myself collecting the parasitic *Orchideæ* of these shaded situations, of which three species are very generally diffused through the forest, although difficult of access, since they hung from the highest branches generally of the largest timber trees, which I had not possibly the means of cutting down; however, I collected of the following as much as my enfeebled packhorse could possibly carry away, carefully packing them in moss which is most abundant in these woods—*Sarcochilus falcatus* in flower at this period, growing on the branches of *Atherosperma; Dendrobium pugioniforme* (allied to *D. rigidum*), and a third species with long cylindrical leaves, hanging from the highest trees. I succeeded in gathering specimens in flower of a tree forty feet high, whose natural habits and economy are very remarkable. I have observed it a timber tree distinct in its growth from others in the forest; again it is frequently to be seen blended in connexion with the *Dicksonia antarctica*, the tree-fern of this mountain, each having its separate stem in the ground, but so united above, as to appear a single tree; although on one side could be perceived the rough bark of this tree, and on the opposite the rugged caudex of the tree-fern, and lastly, every specimen of the *Dicksonia* had young seedlings of this tree growing from its stem into which they were well rooted.* *Jasminum gracile* was observed, with *Bignonia australis*, twining round the branches of trees, the former affording me ripe fruit.

" 3d. Much wind and light clouded weather, but no immediate indication of rain so long as the wind continues from the north-west. About 10 A.M., one of my people returned to me with a packhorse to convey the remaining part of my baggage from Tomah: we therefore quitted the mountain, proceeding easterly as briskly as the laden beast could travel, through the thick brushes of this stage, in the hope of reaching our destination ere dusk; however, rain blowing over from the southward, to which quarter the wind had shifted, and every appearance of a stormy boisterous night, induced us to halt at 6 P.M., in the open forest, near to a water-gully about two miles short of my intended stage; heavy rains having drenched us, and a succession of showery clouds continued rising from the southern horizon, showed us the description of weather we might expect during the night.

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* This tree was *Quintinia Sieberi*, A. De Cand.; for the details of this botanical curiosity, See Annals of Natural History, vol. ii. p. 356, *note*.

"4th. Leaving the tent at dawn of day, we reached the encampment in the brush at 7 A.M., where I determined to remain the whole of the day in order to afford rest to my horses, there being also some little grass and abundance of water, although in a scrubby desert. In a circuitous walk I took in the afternoon among the brush in the neighbourhood, I observed several common described plants having young fruit, among which I gathered ripe seeds of *Dodonæa triquetra*, *Metrosideros costata*, *Lissanthe sapida*, *Acacia stricta*, and *Prostanthera violacea*,—evening clouded, but fair.

"5th. About 7 A. M., we broke up our encampment, and proceeded easterly another stage, dividing the loads between the two packhorses according to their respective degrees of strength. With great exertion and fatigue both to my people and horses, we reached the foot of the range at 11 A.M., a distance of four miles from our fires, and there we were obliged to lighten the burdens of our beasts to enable them to reach the summit of Bell's View, sending them down again for the remaining portions of their loads. At 3 P.M., we had descended the range easterly through the forest to the spot whereon we had first encamped upon quitting Richmond, and where we again pitched our tents, intending to remain there a day should my horses require further rest.

"6th. At dawn of day the weather was fair, although the sun rose in a watery cloud. At length some small showers fell in the forenoon, and distant thunder was heard to the southward. I continued at my present encampment throughout the day, more particularly to afford a further rest to my government horse, who it appeared this morning, had suffered much by his great exertions of the week. I traced a water-gully convenient to my encampment, where I procured a quantity of *Renealmia paniculata*, specimens of *Xerotes montana, Celastrus elæagnoides,* a shrub with lanceolate mucronate leaves; *Asplenium flabelliforme,* and *Polypodium attenuatum. Stenocarpus salignus* grew very luxuriant in the ravine which opened from the water-gully."

In consequence of the illness of the horse that had had the severe fall in the mountains, Mr Cunningham was detained some days, and did not finally return to Paramatta until the evening of the 10th. In the course of the month of January 1824, a trip was undertaken to the vicinity of Bathurst, for the purpose of collecting seeds that were at that time ripe. Shortly after his return to Paramatta, the French discovery-ship the Coquille, Captain Duperry, arrived at Port Jackson, and Mr Cunningham tendered to the scientific gentlemen attached to that vessel, the advantages he possessed of a long acquaintance with the country, for the means of forwarding their various pursuits during their stay in the colony, and he always spoke with great pleasure of the acquaintance he thus formed with MM. Dumont D'Urville and Lesson, the first an officer (and a botanist), the latter the naturalist of the expedition.

At the latter end of March, Mr Cunningham started with his people on a tour to the southward of the colony, through the counties of Camden and Argyle; he also visited Lakes George and Bathurst, the head waters of the Morrumbidgee, Brisbane Downs (the Monaroo of the aborigines), Marley's Plains and the Shoalhaven gullies. The tract of country through which they travelled being of a generally good grazing character, did not afford so much botanical novelty as had been anticipated, but still some of the discoveries were interesting, from the curious identity of vegetation in many parts with that of the country in the vicinity, and to the northward of Bathurst on the western side of the great mountain range. A plant also of the south coast, discovered at Port Philip in 1802, by Mr Brown, (*Lomatia ilicifolia*), was also found in great profusion in the district of Argyle.

The singular limestone caverns, at the Shoalhaven gullies, appear from the short visit Mr Cunningham paid them, as one of the most interesting points of his excursion, and he much regretted, that time and proper facilities alone prevented his bestowing a more lengthened investigation of those apparently very extensive natural excavations. The distance travelled over in this journey was about four hundred and twenty miles. They returned the first week in May to Paramatta.

The months of July and August were spent at Mr Cunningham's favourite botanizing ground Illawarra, from whence a very valuable and extensive collection of living plants were brought to Paramatta, and planted in small boxes or pots, to establish them previous to their removal to this country. One among the remarkable plants collected on this occasion was, the lofty tree-nettle of that district, (*Urtica gigas*, A. Cunn.), a tree measuring occasionally eighty or ninety feet in height, with a diameter of three feet, and also having violent stinging propensities, producing great irritation in the part affected for twenty-four hours. While on this journey, Mr Cunningham received intimation of the intention of Mr Oxley to proceed to Moreton Bay for the purpose of examining the shores of the Brisbane, as to their capabilities of supporting a colony on their banks; and, as it was very much his wish to join this expedition, he hurried his return to Paramatta for that purpose, and having made the necessary arrangements for the employment of his people during his absence, he embarked with one servant, on board the Amity brig, and sailed from Port Jackson on the 1st of September. The party reached Moreton Bay on the 11th, having touched at Port Macquarie on their passage. A boat expedition to survey the river Brisbane was projected soon after their arrival, in which Mr Cunningham accompanied Mr Oxley; they prosecuted their researches to the termination of boat navigation on the river; and although disappointed in their expectations relative to its length, they were rewarded by the discovery of a most valuable tract of country well fitted for the intended objects of the expedition. The botanical productions were of a particularly interesting character, among which may be mentioned—*Araucaria Cunninghamii* (*A. Brisbanii,* A. Cunn.), now first ascertained to be distinct from the Norfolk Island tree (*A. excelsa*), *Codonocarpus australis,* A. Cunn. (*Gyrostemon attenuatum,* Hook.,) *Flindersia australis* of stately growth, *Acrostichum grande,* A. Cunn., found growing on the last-mentioned tree, *Castanospermum australe,* A. Cunn.,* some epiphytical *Orchideæ,* and many others evidently new; but from not being in flower or bearing fruit, could not then be determined. Mr Cunningham returned to Port Jackson on the 14th of October. The closing journey of the year was one to Bathurst, in which, from the continued droughts, a much smaller collection of seeds was made than had been anticipated. Among the novelties of the journey were *Banksia Cunninghamia,* Sieb., (*B. ledifolia,* A. Cunn.,) *Grevillea anethifolia,* Br. (*Anadenia,* A. Cunn.,) now first found in fruit, and *Eucalyptus mannifera,* A. Cunn.

During the winter months of 1825, (from April to June,) another expedition was undertaken to the north-west. Mr Cunningham left Paramatta the latter end of March, and crossing the Nepean river at Richmond, proceeded northerly towards the Wollomby, one of the southern feeders of the Hunter; from thence his course was altered more to the north-west, to Mount Dangar, whose base he skirted, and, proceeding on the same course, he crossed his route of 1823, and made for Pandora's Pass. From thence he descended into Liverpool plains, where, from the rainy weather, the extremely level country he was traversing was become a continuity of bogs and marshes: he experienced considerable inconvenience. He persevered in his progress across these extensive flats, and reached a more elevated country on the northern side of the plains; from thence he continued his route up Camden Valley to Dunlop's Table Head, lat. 30° 47′ S., long. 150° E., when, finding from the dip of the country, that all further progress to the westward, northward, or north-eastward was impracticable—from the low flat country being under water—he halted for a couple of days to rest his pack-horses, and take the necessary bearings from this his furthest point of progress northward. On the 18th of May he commenced his return journey, and arrived safely at Bathurst on the 7th of June, where he rested a week, and reached Paramatta on the 17th, having completed a circuitous tour of seven hundred miles.

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* Vide Bot. Misc. vol. i. p. 237, t. li, lii, liii, liv.

The general features and character of Liverpool Plains is thus described by Mr Cunningham:—

"Liverpool Plains, which were discovered by Mr Oxley, in 1818, who entered them on the north-west side on his emerging from the great internal marshes, are vast levels comprehended between the meridian of 150° and 150° 50′ East, and within the parallels of 31° 35′ and 30° 45′ South. They are disposed in elongated strips, which vary in breadth from five to fifteen miles, for the most part clear of timber, with the exception of a few straggling trees of *Acacia pendula* and a *Eucalyptus*, which are scattered singly at long distances on the general surface. One uninterrupted tract of level plain, stretching from S. to N., being found by actual odometrical admeasurement to exceed fifty miles, whilst another portion, crossing it from W.N.W. to E.S.E., and extending to the very foot of the grand southern dividing range, formed a base of not less than sixty, and perhaps seventy miles. From these two principal branches, lateral ramifications stretch themselves N. and S., of which Camden and Barrow's valleys are of the former direction, and the rising grounds which are remarked to intercept the plane surface of this region, being by these minor branches perfectly isolated, form detached elevations of various figures and picturesque appearance on the general surface, whose entire area, included within the above-mentioned meridional and parallel lines, may comprehend a space of 1,500,000 acres, of which four-fifths may be considered in seasons not decidedly wet, available for all the purposes of agriculture, and more especially cattle-grazing, and many fine dry situations on the acclivities of the rising grounds that stud its surface, and that are perfectly beyond the reach of waters, at a time when the levels are subjected to an inundation by a rainy season, affording a healthful walk for sheep.

"These great plains are watered by a brisk stream, which has its rise in the grand dividing southern range already adverted to, meandering northerly through them, and at fifty miles from it is united with the York River, which eventually becoming governed in its course by the dip of the country at N.N.W., makes its exit at that point of bearing, and in less than one hundred miles from its origin, pours its tributary waters into the depressed internal morasses—that common vortex that lays claim to all our western waters.

"We know of no other tract of timberless open country in New South Wales, that forms so perfect a level as this extensive portion of our interior. It is impossible to conceive a truer plain of any spot of ground constructed by the hand of labour,—its natural consequent therefore is, that ordinary rains, falling on the southern mountains, cause an overflow of the rivulet that waters it; and as the surface is generally somewhat lower than the outer banks of the stream, the greater part of the plains, together with the boundary forests on the same level, are laid under water to the distant boundary hills, of which fact the wrecks of floods on the rivulet banks, and the general bogginess of these forests afforded us an ample proof. From the appearance of these indications, we were able to gather that the last considerable inundation had been assuredly as recent as the months of January or February last, (the level character of the country, and the time required to admit of the retiring of the waters being taken into consideration,) and although the general body of deluging water had almost wholly subsided, portions of the northern sides of the plains had a depth of 12 inches resting on its muddy surface, which effectually determined the limit of my journey to the northward.

"The soil of these plains, as may be readily presumed, is of an alluvial character, the successive depositions of the irrigations I have mentioned: parts, however, that I examined, had an admixture of the débris of the sandstone rocks that are found in decomposing masses at the base of the distant boundary hills.

"The prevailing vegetation that clothes these fertile plains, and where exuberance of growth was obvious to all, were of the following species:—

Ajuga australis,
Plantago Struthionis,
Xeranthemum bracteatum,
Centaurea occidentalis,
Scorzonera sp.,
Galium aparine,
Dianella ensifolia,
Dalea sp.,
Podolepis rugata,
Rumex dumosus,
Campanula gracilis,
Ranunculus lappaceus,
Imperata arundinacea,
Chloris sp.,
Danthonia gigantea,
Indigofera sp., and the proof of a permanent marsh,
Lobelia inundata,
Mimulus gracilis,
Gratiola latifolia,
Cyperus sp.,
Arundo Phragmitis.

"Although I determined (trigonometrically,) the heights of several of the leading features of the boundary hills, of which no one exceeded eight hundred feet above the common plane of the circumjacent country, I had nevertheless to regret I could not ascertain the approximate elevation (not having a barometer,) of these great plains above the surface of the ocean; however, taking the actual barometrical admeasurement of the downs of Bathurst as a *datum*, and then using the results of the attentive observations of Mr Oxley, of the fall of the country to Wellington Valley, at four hundred feet below the settlement, and my own of the gradual rise again of the land to Pandora's Pass, through the mountain range that divides Liverpool Plains from Hunter's River, I feel confident in the assertion, that the height of these extensive levels will, when actually measured, prove to be 2400 or 2500 feet above the sea."

The three last months of the year 1825 were spent in the vicinity of Wellington Valley, where a circuit of about one hundred and fifty miles on each side of the Macquarie River, afforded a collection of seeds, specimens, and the tuberous roots of twenty-five species of terrestrial *Orchideæ*, for a shipment to the Royal Gardens. Mr Cunningham was compelled at this period to place himself again under medical control. His state of health on his return from his late tour being considerably disorganized, and he was also suffering from a severe bilious attack; however, by the end of February he was sufficiently recovered to pursue his varied labours with renewed vigour. A change of governors had taken place during his absence. Lieutenant-General Darling had replaced Sir Thomas Brisbane, and Mr MacLeay had arrived at Sydney, to perform the duties of colonial Secretary. The next six months were employed in visiting the vicinity of Cox's River and the Illawarra district—at both places collections were made for future transmission to England.

A voyage to New Zealand having been long contemplated by Mr Cunningham, and the necessary arrangements having been made for the employment of his servants and horses during his absence, he embarked on board the Indian whaler for that interesting group of islands on the 28th of August, and landed on the 9th of September, at Paihai, the Church Missionary station at the Bay of Islands, where he was cordially welcomed, and most hospitably received by Mr Williams the head of the missionary department in New Zealand, to whom he brought letters of introduction from that exemplary clergyman, the Rev. Mr Marsden, the worthy founder of the missionary establishments in New Zealand. Mr Cunningham's first excursion was a boat expedition up the Wycaddy river, and of which he says—

"We pulled about two miles from the entrance, when we reached the Cowa-cowa, a branch of the Wycaddy, proceeding from the south, whose banks at a few miles from its confluence are occupied by dense forests, (abounding with the Kai-Katea (*Dacrydium excelsum*, Don.,) and other pines of large size) which I should have rejoiced to have visited. However we continued upon the main river another two miles, and then hauling in upon a rocky point on the north shore, landed. Whilst my friends amused themselves on the strand and skirts of the forest overhanging the bank, I ascended its steep acclivity, and with some difficulty effected a penetration through its underwood to the pitch of the ridge which appears generally to characterize the banks of this stream. Among several plants, unknown at present to me, being without fructification, that form small trees from fifteen to twenty-five feet high, I rejoiced to recognise a few of the genera of Forster, viz.:—*Veronica elliptica*, a woody plant richly in flower, *Corynocarpus lævigatus*, showing flowering spikes, a very ornamental slender tree, with dark-green glossy foliage, *Coprosma lucida*, with clustered axillary flowers, *Gaultheria antipoda*, *Cineraria* (*Brachyglottis*) *repanda*, a remarkable shrub with large ramified panicles, *Panax arboreum*, *Lotus arboreus*, (*Carmichaelia australis*, Br.,) I also gathered specimens of a shrub of *Gentianæ*, and seemingly of our colonial genus *Logania* (*Geniostoma ligustrifolium*, A. Cunn.,) *Leucopogon sp.* of Mr Brown's first section, &c. In these woods, teeming with humidity, cryptogamous plants abound. I gathered a few Mosses, and some Ferns of the genera *Polypodium*, *Aspidium*, *Asplenium*, *Davallia*, (*Loxsoma*, R. Br.), *Doodia*, and *Pteris*, some of the first genus adhered to trees, but among the parasites (*Astelia?*) I could not perceive any of that most interesting tribe *Orchideæ*. That genus of *Proteacea*, *Knightia*, I remarked a mere shrub, but nevertheless putting forth flower-buds. On the margin of these woods, just beyond the reach of the flood-tide, I perceived *Myoporum lætum*, *Lepidium oleraceum*, and a branching tree thirty feet high, with ternate and quinate leaves (*Vitex littoralis*, A. Cunn). In penetrating these woods, I met with much impediment from the arundinaceous supple rambling stems of a *Smilax* (*Ripogonum parviflorum*), a single species of scandent *Rubus*, (*R. cissoides*, A. Cunn.,) with quinated narrow leaves, and the wiry stem of a species of *Lygodium* (*L. articulatum*,) without fructification. Quitting this shore, we stood up the river a short distance, and again landed at a small native village, consisting of a few miserable hovels, scarcely capable of sheltering its inmates from the weather, being generally in a dilapidated state. The men were absent in their canoes, while their women were busily engaged in the preparation of the soil, which was very poor and stony, for the planting of Koomeras, or sweet potatoes. This operation was effected by a careful clearing of the surface of weeds, and then loosening it by a superficial digging, which exposed to our view the hungry nature of the soil. As the weather appeared doubtful, and the wind had freshened much in the N.E. quarter, it was proposed to return; and by the hour of three in the afternoon, when we reached the open bay, the breeze had considerably increased, rendering it better for the boat to continue along shore direct to the ship, rather than pull so far to leeward to land me at the missionary station. I therefore passed the night on board the Indian, and landed early next morning—it being my full intention, in order to form a clear idea of the vegetation of the woods, in the environs of this station, ere I commence my journeys to those at a distance, to make an excursion among the hills immediately at the back of this little settlement. To afford an idea of the face of the country, it appears necessary here to state, that the surface of this part of the island (and I am informed it is generally so,) is a continued undulation constituting an assemblage of rounded hills and interjacent valleys, without any absolutely lofty land of mountainous character, or open level plains. The summits of many (all ?) of these rounded hills are covered with *Pteris esculenta,* to whose roots the natives have, as their *dérnier ressort*, a resource whenever their sweet potatoes or maize crops fail. This species of Fern grows about three feet high, is very dense, and among it is frequently interspersed that rambling plant *Coriaria sarmentosa* of Forster, from the baccated fruit of which the natives express a drink, said to be intoxicating. The slopes or declivities of these hills, and the interjacent valleys themselves, which are frequently exceedingly sharp in proportion to the proximity of the summits, and the dip of declivity, are clothed with trees of great verdure, but of very ordinary size, beneath whose shade exists an underwood so dense as to be difficult of penetration. In these narrow valleys, therefore, which furnish generally at their base a rill of water, it was, I sought to occupy myself in my onset, in my attempts to make myself somewhat acquainted with the vegetation of this neighbourhood, and although the fatigue of climbing sharp acclivities, descending abrupt slopes, and penetrating coppices, almost impervious, was excessive, I cannot say that I was not repaid by the novelty and variety of the plants *phænogamous* as well as *cryptogamous,* which these solitudes display. In some open places on the hills, *Leptospermum scoparium,* referred to by Captain Cook, was in flower, and if its habit reminded me of the colony of Port Jackson, and the friends I had left there, the pretty genus *Drosera*, so common in Paramatta, and here at this period found in flower, did not fail to stir up within me feelings of affectionate remembrance for those whose courtesies I had experienced, and of whose hospitality I have so often partaken. On the skirts of the woods I gathered specimens of *Gaultheria antipoda* in flower, and young fruit. Upon the trunks of the larger trees were some fine Mosses, and three species of *Polypodium,* besides (to my joy,) a charming plant of *Orchideæ,* (*Earina mucronata,*) with very narrow elongated leaves, bearing white flowers, which were, however, beyond my reach, but of which I shall secure plants on my return again to the colony. *Knightia excelsa* here grows to the height of sixty feet, and was putting forth its flower-spikes, as was also a tree called by the natives Koa-Koa, which I apprehend from its habit to be a *Trichilia* (*Hartighsia spectabilis*). In spots less secluded from the solar rays than the general mass, I detected *Fuchsia excorticata* richly in flower; and what really added to the novelty and beauty of the plant is,—its pendant flowers, on their first expansion, are of a bluish-green cast, which afterwards change to red; and thus the plant has at the same time flowers of two distinct colours: it forms a small tree of twelve feet in height. Among the Ferns on the hills I observed *Thelymitra longifolia,* Forst.

(*T. Forsteri, Sw.*) one of the few *Orchideæ* found by Forster in New Zealand."

An opportunity shortly occurred for Mr Cunningham being enabled to visit the west coast of the northern island. A party of his missionary friends having occasion to repair to the station at Hokianga, Mr Cunningham took advantage of the circumstance, to travel in company with these gentlemen. Their first stage was by boat to the station on the Kiddee Kiddee River (Sept. 20th), where they were detained the whole of the next day by the threatening appearance of the weather; however, they took the opportunity of visiting a cascade on the river, of which our traveller speaks in the following terms:—

"We at length penetrated to the margin of the river, where a most picturesque fall of water, from lofty rocks of the whinstone structure, was presented to us, of an interesting and imposing effect; the more so as its perpendicular drop is considerable, for an island of such a flattened or depressed character. The river, at the point at which we had intersected it, murmured over whinstone pebbles, and formed a breadth not exceeding thirty feet. About an hundred feet higher up the river, the column of water fell into an ample, seemingly deep basin, at least eighty yards in width. We all stood awhile to contemplate the grandeur of the scene, amidst a heavy surcharged humid atmosphere, arising from the vapour that enveloped everything around us. From the bed of the river above this vertical dip, its waters fall, in one unbroken body, a space we estimated at seventy feet, into a continuation of its channel, much deepened by the perpetual pressure and wear of the falling column, whose breadth at the edge of the upper bed might exceed forty yards. Perceiving a deep recess within the cataract, formed by an excavation of the decomposing rock, from which rose a continued mist, I crossed the river, and by passing on the skirts of the woods vesting the banks, crept round into this spacious cavern, which being lined with a verdant vegetation, naturally excited my desire to explore its interior, in the hopes that from its sides and even roof, some *Filices* and *Musci*, new to me, might be met with. However, I found the whole cryptogamous vegetation to consist of a *Blechnum* (*Lomaria?*) an *Aspidium*, a *Doodia*, some Mosses and phænogamous plants, already noticed. This excavation, which at present falls back in depth about sixty feet appeared to be enlarging by the disengaging of the decomposing or softer parts of the sides and roof, which falling down on the area beneath, is in part carried away by the impetuosity of those floods which at periods swell the river to an increased rise of two fathoms, when the cave is partially filled with the violent eddy waters which are naturally formed by the increased column at these periods. We found the marks of the flood on the branches of the overhanging trees."

On the 26th, they reached the mouth of the Hokianga river, after a toilsome journey from the wretched native paths they traversed, encumbered with a perfect network of matted roots, rendering it both painful and dangerous from their slippery state, to walk over; and also much inconvenience was experienced from the continued rains that rendered their bivouacs very unpleasant, and made the drying of botanical specimens a very tedious and almost hopeless process. Of the appearance of the headlands at the mouth of the river, Mr Cunningham says,—" Nothing can exceed the extremes of sterility its surface presents, the whole north Head appears a ridge of drift sand fifty or sixty feet above the sea, of which a large portion is perfectly devoid of vegetation. Many patches we found upon landing, to be formed in part, of an admixture of sand and argillaceous earth indurated by the weather, and loaded with an incrustation of iron sandstone, whose exterior presented nodules, fistulose or pipe-shaped pieces of the same material were also found scattered on the surface, where small pebbles of carnelian were not unfrequent. On a closer examination of this remarkable Head of the river, it appears of the following geological structure: the base or lowest stratum visible, is an indurated white clay or marl (a few feet), its superincumbent a pudding-stone or bed of agglutinated gravel of whinstone pebbles, fifty to sixty feet thick, dipping S.E. and S., upon which, as the upper stratum, ridges 700 to 800 feet high of loose sand in some parts incrusted as above. Large masses of the pudding-stone were scattered on the beach ; the whinstone pebbles of which it was composed were mostly spherical, and about the size of a 32lb. shot. The vast sands which rest on this *detritus?* of the last catastrophe of our planet, are of a brownish colour (probably tinted by iron everywhere prevalent), and contain many small clear crystals. The only vegetable that appeared capable of maintaining an existence in such an extreme sterility of soil was *Arundo australis,* which grows in small tufts, and probably having long roots, found nourishment deep beneath the surface, where doubtless there is water; since in the declivities we observed a smart percolation of that element, which in the progress of its descent to the actual beach, frequently was taken up by the thirsty aridity of the sands, and as often burst forth again at the surface, as the situation or position of the sand ridge might be. From the summit of the Head we had a distinct view of the entrance of the river, which we had just apprehension to fear, from all reports of it, was pregnant with danger.* However, notwithstanding the wind was acting against the ebb tide, the break of the sea was only in parts on the bar, which is said to be of various depths, extending from one shore to the other. We perceived patches, over which we were told there were four fathoms at low water, which did not break, and which, to a person on shipboard, knowing the boundaries of the danger, might be considered a safe channel of entrance to vessels as large as 400 tons, having a leading wind and flood tide. Respecting the little missionary vessel which we had expected to meet here on our arrival, we learned that a native had seen a small craft answering to her description two days since, off the mouth of the river, which at length stood off to the westward and disappeared. I took a range on the higher points connected with the Head, which from the beach has a pleasant verdant aspect. I had however to regret, at the close of a fatiguing journey, to return to our tent with only a solitary plant worthy of consideration: it was *Cassinia leptophylla*, which forms a shrub of compact growth on the lower sand ridges. *Fuchsia excorticata*, with its pendant diversicoloured flowers, ornamented the brushes in those spots nearer the beach, which were composed of *Coriaria sarmentosa*, *Clematis indivisa*, and some other shrubs frequent on the shores of the Bay of Islands."

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* They were expecting a small vessel belonging to the Missionaries, to meet them at this river.

They continued at the mouth of the river until the 2d of October, when, hearing no intelligence of their schooner, which they now considered had returned to the Bay of Islands, they struck their tents, and turning their faces to the eastward, commenced ascending the river on their route homeward, and reached Paihai at sunset of the 4th, much fatigued with their journey, from the almost continuous rains of this ever-weeping climate, and the execrable route they passed over, of which Mr Cunningham observes,—"With considerable labour, and much inconvenience to ourselves and the natives who carried our baggage, we traversed the irregular surface of these forests,* netted with the naked roots of the trees for five hours, when we all rejoiced to reach the open country, around which we could extend our view for several miles. No person, who has not had experience, can form an adequate idea of the painful sensation excited in the soles of the feet, by a continued treading upon exposed bare roots, on a journey of several miles through these woods. The pain I endured, at the close of the day, was similar to what would be experienced by boiling water removing the cuticle of the soles of the feet; great as were these distressing sensations to me, notwithstanding my feet were protected by strong shoes,

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* It was on the margins of these forests Mr Cunningham discovered that interesting genus *Alseuosmia*, whose elegant flowers adorned the woods, and its delicious odours filled the surrounding atmosphere with fragrance.

I was surprised to observe in how small a degree the feet of the natives were affected."

Shortly after this, Mr Cunningham took a canoe expedition up the Cowa-Cowa, a tributary of the Wycaddy, and the following are some of his observations on the primitive forests that line the river's banks :—

"On this occasion I took with me a fortnight's provisions for self and native servant, and eight small plant boxes for living subjects of desirable genera, whose seeds cannot be transported to our colony, or are not produced in the seasons of my stay in this island. The Cowa-Cowa at its confluence with the Wycaddy, appears full a mile wide, from which ample breadth however, it soon diminishes to about five hundred yards, and at the extent of ten miles narrows to rapids not more than twenty yards in width. The waters of these rapids we found of very considerable strength, rolling over a coarse pebbly bottom that required no ordinary exertion on the part of our natives to use their paddles effectively against its influence. Passing round the extremity of a small island formed by the deposits of successive freshes for years past, and now clothed with a density of vegetation particularly of *Coriaria, Coprosma, Gahnia, Logania, &c.*, we stopped and encamped on a bed of gravel. A succession of moderately elevated rounded mounds or hills, densely wooded with small timbers, generally characterize the banks on each side the Cowa-Cowa,—the dividing or interjacent valleys presenting many minor ravines worthy of examination in my descent of the river next week. A gannet that was shot furnished not only a repast for our natives, but its feathers were converted into ornaments for their heads. The next morning (Oct. 18th), we continued our course up the river which preserved a nearly uniform breadth of twenty yards, for the most part of deep water, and bounded by close brushes and shaded forests. At a short distance from our encampment, we observed some patches of land cleared for cultivation, and in its vicinity is situated a native village of some magnitude. Beyond this spot, the banks, which are not above eight feet high, are closed up by woods in which Kai-Katea, (*Dacrydium? excelsum*) of gigantic stature (80 to 100 feet), were frequent amidst the groups of other timbers of considerable bulk. These forests partake of the same character generally of the other parts, for in a range I took through them, many of the same trees were frequent in exactly similar states without fructification. From the head and limbs of a large Kai-Katea, that had been felled for timber, I furnished myself with specimens in fruit, as also from a *Laurus* (*L. Taraira*), that had been broken down by the fall of the Kai-Katea. I also gathered seeds of *Ripogonum parviflorum*, and of the delicate *Renealmia* (*Libertia micrantha*), whose white flowers form a striking contrast to the heavy green of the *Filices* in these woods. The large pigeon and a brown macaw abound in these forests, each finding ample provision in the fruit of *aurus Taraira* as well as the flowers of the climbing plant of *Pandanæ*, (*Freycinetia Banksii*, A. Cunn.), which are much sought after by the latter, and other birds on account of the succulent bracteas, which partaking of a sweetish taste, are eagerly eaten also by the natives. This scandent reedy-stemmed plant which first arrested my attention on the Hokianga, I rejoice to observe so abundant in these woods, from which I shall remove its younger plants, with the hope of introducing them in England. In open places beneath the shade of the ferns, I found a little *Hypericum* (*H. pusillum*), of procumbent tufty habits, and in the brushes detected *Rubus cissoides*, profusely in flower. A tree sixty to seventy feet high, with smooth lanceolate leaves, which I had frequently noticed previously, I this day found bearing ripe fruit, proving it to be another *Laurus* (*L. Tawa*). In the alluvial soil on the banks of the river, I was much gratified in finding a plant of *Pterostylis*, (*P. Banksii*, R. Br.), remarkable for the noble size of the flower, which is produced at the top of a foliaceous stem a foot high. The plant appears rare, as I have only met with but few specimens, after a diligent search for it in the neighbourhood of the spot where I first met with it. The Cowdie or Kauri, (*Dammara australis*,) in these woods were very fine, of tolerable size, seventy feet high, and with some Kai-Katea (*Dacrydium? excelsum*), and Tanekaha (*Phyllocladas trichomanoides*), were the largest timbers these woods furnish. I procured some young trees of the latter for planting in my boxes: the *Richea* looking tree (*Dracophyllum latifolium*,) observed last month on the Kiddee-Kiddee river, I remarked in similar situations to-day without fructification, and of sub-arborescent growth. In descending the river, I landed on the banks in several places to fill my remaining boxes with *Knightia excelsa*, *Laurus Tawa*, and some other interesting plants. By reason of the flood tide having set, it was not until after sunset that I was enabled to reach Paihai."

Some of the gentlemen attached to the station, being about to visit Wangaroa, Mr Cunningham availed himself of the opportunity, and accompanied them. While on this expedition he had the good fortune to detect a second species of that fine order *Proteaceæ*, (*Persoonia Tora*, A. Cunn.,) only one being previously known, viz., *Knightea excelsa*, he also found the *Areca sapida* of Solander, in flower, which, from its hexandrous free stamens, he thinks improperly placed in *Areca*. His stay at Wangaroa was shortened on account of a quarrel among the natives, the result of which at one period appeared likely to assume a very serious aspect, so far as his missionary friends, with whom he was residing, were concerned; however, they contrived eventually to divert the wrath of the natives from themselves, and returned in safety to Paihai on the 23d of November. A trip to the Bay of Plenty, about two hundred miles to the southward of Paihai on the same east coast, was afforded Mr Cunningham, by the missionary vessel visiting that port for provisions: the result confirmed an observation of Sir Joseph Banks, of the great sameness of vegetation of widely separated tracts in New Zealand; for Mr Cunningham detected no plants that he had not previously found even as far north as Wangaroa. A few short excursions in the vicinity of the Bay of Islands terminated Mr Cunningham's sojourn in New Zealand. The kindness of the Rev. H. Williams, and the other gentlemen of the missionary station at Paihai, afforded him a return passage to Sydney in their little schooner the Herald ; and after an affectionate farewell of his kind friends, with whom he had resided for four months, and from whom he received every possible attention and assistance in his pursuits, he embarked with his collections (which, from the unsettled state of the northern part of the island, were somewhat circumscribed,) on the 29th of December, and after a tedious passage from adverse winds, landed in Sydney on the 20th of January, 1827.

The botanical products of this expedition are given at length, with descriptions of the new plants in the *Companion to the Botanical Magazine*, Vol. II., and the *Annals of Natural History*, Vol. I. to IV., under the title of *Floræ Insularum Novæ Zelandiæ Precursor*, or a specimen of the botany of the islands of New Zealand, by Allan Cunningham, Esq.

Mr Cunningham having understood that it was the wish of the colonial government that a more extended exploratory journey should be made in the north and north-western interior, for the purpose of investigating the capabilities of the country for agricultural and other purposes, communicated with the governor, lieutenant-general Darling, through the secretary, Mr M'Leay, intimating his desire to conduct an expedition for the proposed purposes, and gave a general detail of the route he intended to pursue, and the portion of country he wished to investigate. In his public letter he says, "I have the honour to state to your Excellency, that in the prosecution of this journey, it is my design to proceed, in the first place, by the most eligible route from the colony (Paramatta) to Peel's River, a stream that was discovered on the north side of Liverpool Plains, by our late indefatigable surveyor-general, Oxley, in his journey of 1818, who found it situate within the meridians of 150° and 151° East, in or about the parallel of 31° South. Upon fully preparing myself for my journey, I would take my departure from the point at which Mr Oxley had crossed this river, and in the direction of the meridian, would penetrate north to the parallel of Cape Moreton, in lat. 27° South. In this northern journey would be ascertained the general features and character of a portion of our interior, comprehending four degrees of latitude, as also its geological structure, the nature of its soil, the importance and value of its timbers, and the number, magnitude, and velocity of the streams by which it is watered. In this excursion, moreover, would be determined how far the Brisbane River is to be considered as originating in the high lands near the coast, or whether the opinion that has prevailed is correct, of the identity of its stream with some presumed outlet from the eastern margins of our interior marshes, which (presuming that the declivity or dip of the country easterly favours the hypothesis,) may exist during certain periods, of extensive overflows, occasioned by the vast quantities of water that are known to be poured into them by our own western rivers, during seasons of long rains. Should circumstances connected with my establishment permit, and a dry season favour me, it is my design, upon reaching the latitude of 27° S., to devote a portion of time to a western excursion, direct in the interior, with the view of gathering some facts in reference to the magnitude of those great marshes, and their extent northerly, from the latitude of $30\frac{1}{2}$° S., in which parallel Mr Oxley quitted their eastern margin in 1818. Independently of this consideration, the course I should thus pursue, and also my subsequent eastern and south-eastern routes, to an intersection of my outward track, would afford me the means of reporting to your Excellency on the variety of country my expedition would traverse. Should, however, the season prove wet, and the general aspect of the weather furnish too evident indications of an approach of much rain, upon my arrival at the parallel of 27° S., rendering it hazardous to my party to dip into a low declining interior, such as I am disposed to apprehend exists in that parallel of latitude, it would be highly imprudent to quit my position on the high eastern lands. Having, therefore, by an easterly course, endeavoured to discover the point at which Major Lockyer had penetrated up the Brisbane River from the sea, in September, 1825, in which I may be aided by extracts in my possession, from the journals of that gentleman, I propose, then, (having determined the geographical position of his extreme point of penetration,) to pursue a southern course, through the elevated country lying to the eastward of my outward-shaped track, and in my progress homeward, I feel satisfied I shall gather such particulars in reference to the very considerable expanse of undulated country stretching to the parallel of 31° S., as will prove highly interesting to the grazier, and important to the colony in general. In the progress of this lengthened tour, it will be my first consideration to construct a sketch of my route, on geographical principles, noting the directions of all the principal mountain ranges, and fixing their positions, not simply by the series of angles I shall employ throughout the country as I proceed, but by daily altitudes of the sun, taken at the meridian, and lunar distances, as often as these can be effected in the progress of the month. It will, moreover, afford me great pleasure (provided I can obtain, upon my return, daily corresponding observations made in Sydney during my absence), to observe the height of the mercurial column at special periods each day, throughout my journey, in order that I may be able to determine, by barometrical admeasurement, the elevation above the ocean, of the country over which I may travel. To effect these important and very interesting points of this proposed journey, it is my intention to carry with me a sextant of superior description, divided to $10''$—a Schmalcalder's compass, combining most satisfactorily the circumferentor, the traveller's and azimuth compasses, for the determination of the magnetic variation—an odometer, to measure the base lines—a mountain barometer, and a pocket chronometer. Having submitted at length to your Excellency a scheme of my proposed northern tour, of which the result will furnish an important material to fill up a considerable blank in the charts of the colony, I have the honour to lay before your Excellency a requisition for an outfit adequate to this journey, on which I shall be happy to proceed on or about Monday, the 26th of March next.

"I have the honour to be,
"Your Excellency's most obedient humble servant,
"ALLAN CUNNINGHAM.
"*19th Feb.*, 1827."

"His Excellency, Lieut.-General Darling."

This proposal was accepted, and on the 30th of April Mr Cunningham took his departure from Segenhoe,* (on an upper branch of Hunter's River,) with six men, and eleven heavily laden horses, pursuing his journey northerly, along the eastern skirts of Liverpool Plains. On the 11th of May he crossed Mr Oxley's track easterly, towards Port Macquarie, in 1818, and from that point the labours of the expedition commenced, on ground previously untrodden by civilized man. On the 19th of May they entered a valley in lat. 30° S., which was named Stoddart's Valley, (after Mr Cunningham's esteemed friend, lieutenant, now lieutenant-colonel Stoddart,) and shortly after came upon the Peel River, and were enabled to ford it at a part where the breadth was diminished to fifty yards. On the 25th they had reached lat. 29° 10′ S., and there found a termination on the west to the hilly country they had lately traversed. "A level open interior, of vast expanse, bounded on the north and north-west by a distant horizon, broke suddenly on our view. At north-west, more particularly, it was evident to all of us that the country had a most decided dip, and on that bearing the line of sight extended over a great extent of densely wooded or brushed land, the monotonous aspect of which was here and there relieved by a brown patch of plain; of these some were so remote as to appear a mere speck on the *ocean* of land before us, on which the eye sought anxiously for a rising smoke, as indicative of the presence of the wandering aborigines, but in vain; for, excepting in the immediate neighbourhood of a river of the larger magnitude, these vast solitudes may be fairly said to be almost entirely without inhabitants. We had now all the high grounds on our right hand, or to the east of us, and before us at north, a level, wooded country."

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* The packhorses and their leaders had been sent overland, unladen, to this station, the whole of the baggage of the expedition having been forwarded by sea to Newcastle, and thence taken up the Hunter in boats, to Segenhoe, Mr Cunningham accompanying it.

Mr Cunningham's intention of reaching the parallel of 27° S., on the meridian he was travelling on, was frustrated by the arid country he now got into, and after crossing the parallel of 29° S., he altered his course to the north-east and eastward, and shortly after crossed Dumaresq's river, which at that point had a channel of from eighty to one hundred yards in width, but the stream in its present state was diminished to about thirty yards wide, and apparently very deep. It was not until they had passed the meridian of 151° E., that they came into a country capable of affording their nearly famished horses a better means of subsistence, and on the 5th of June they reached an extensive clear tract of country, generally well watered, and affording apparently at all seasons of the year, grass and herbage of an extraordinary luxuriance of growth. These extensive tracts of clear pastoral country were subsequently named Darling Downs, in honour of his Excellency the governor: they are situated about the parallel of 28° S., and stretch east eighteen miles to the meridian of 152° E. They are watered by a chain of ponds which in wet seasons become united, and form an auxiliary to the Condamine river, which winds along their south-western margin. The elevation of these downs above the level of the sea is about 1800 feet. Other clear lands in the vicinity were respectively named Canning's Downs and Peel's Plains; and from a square-topped mount in the neighbourhood, the view to the N.W. was over an immeasurable expanse of flat wooded country, without the slightest eminence to interrupt the common level, which, in consequence of the very clear state of the atmosphere, could be discerned to a very distant line of horizon verging on the parallel of 27° S. From the spacious surface of the vast levels, which are covered very generally with small trees, not a single smoke was seen to arise to indicate the existence of the wandering native in these solitary regions. As all observation easterly towards the coast line, from the point of the ridge Mr Cunningham had ascended, was prevented by the more elevated ranges in the neighbourhood, he quitted the spot on which he had encamped at its foot, and with the view of penetrating towards the higher points of these mountains, proceeded south about four miles; when, on passing round the base of a second hill, which was named Mount Sturt, (in compliment to Captain Sturt, 39th regiment,) the party entered a very beautiful grassy valley, bounded by lofty lateral ridges, and extending several miles in a north-eastern direction to the foot of the principal range. Advancing a few miles up this vale, which was named after Captain Logan, the then commandant of the penal settlement on the Brisbane river, Mr Cunningham encamped on a small brook meandering through it to the south; and as the condition of his horses, and the state of his provisions, obliged him to close his journey northerly at this valley, he determined to occupy a few days in a partial examination of the adjacent country, and in making the necessary observations for ascertaining the situation of the encampment previous to commencing his return line of route.

On the morning of the 11th of June, Mr Cunningham, accompanied by one of his people, proceeded to climb the hills immediately above the tents, the elevated summits of which appeared likely to afford him a view of the surrounding country, particularly to the eastward. Gaining, after some exertion, a lofty point of the lateral ridge, they observed through some hollow parts of the back of the main range (which stretched before them at a distance of about ten miles,) portions of the country lying in the vicinity of the Brisbane river, at north-east, as also parts of the more distant lands situate at the base of the Mount Warning ranges, the cone of which was distinctly seen crowning that group of mountains at an estimated distance of 65 or 70 miles, bearing East

9° South. Had the weather continued favourable, it would have been important to have examined the main range with the view of ascertaining how far a passage could be effected over it to the shores of Moreton Bay or Brisbane River, from which points only, the very interesting pastoral country lying on the western side of these mountains can be accessible. A very singular, deeply excavated part of the range, bearing from the station on the ridge about N.N.E., was, however, remarked, to the pitch of which the acclivity from the head of a valley lying parallel with Logan's Vale, and extending south-westerly to Darling Downs, seemed very moderate; and as this gap appeared likely to prove on examination a very practicable pass through these mountains, Mr Cunningham determined to employ a day in exploring it. These mountains, to the western base of which the exploring party had approached from a sterile southern region, form a leading range in this part of the country, and give rise to waters that fall as well on the coast as westerly to the distant interior; and as the barometrical observations, made on the lateral range whence the peak of Mount Warning was seen, gave a result of 3735 feet, and the extreme ridge appeared at least 300 feet higher, the elevation of this dividing range may be considered about 4100 feet. The forest ridges, which were heavily timbered with stringy bark (*Eucalyptus*) of great bulk, were found clothed to their summits with grasses of the most luxuriant growth; and being well watered by numerous trickling rills that appeared to originate between the shoulders of the hills, constitute a very spacious range of the richest cattle-pasture.

Upon examining the hollow back of the mountain ridge, it was found to be very rugged, large masses of rock having fallen down from the heads on each side into the gap, rendering it impassable; and as it was overgrown with strong twining plants, the thicket they formed was found nearly impervious. Immediately to the south, however, the range presented a very moderate surface, over which a line of road might be constructed without much labour, and at comparatively small cost, as the rise from the valley, extending from Darling Downs, proved by no means abrupt, and the fall easterly, from the ridge to the forest ground at its base, appeared of singularly easy declivity. Looking north-easterly from this eminence, the eye traversed with pleasure over a fine open grazing country, very moderately timbered with patches of clear plain and detached wooded ridges, to diversify the surface; and in no part did there appear any obstacle to prevent a communication either with the southern shores of Moreton Bay, or the banks of the Brisbane River. The base of these mountains is of a compact whinstone; on the higher parts was observed amygdaloid of the trap formation, with nodules of quartz, whilst the summit exhibited a porphyritic rock very porous, and containing numerous minute quartzose crystals. The situation of the tents in Logan's Vale was determined as follows:—Latitude by meridional altitudes of the sun, the mean of five observations, 28° 19′ 45″ S., Longitude by account, corrected by bearings taken to fixed points on or near the coast-line, and compared with the mean results of several sets of distances of the sun, and star Antares, from the moon 152° 7′ 45″ E. The variation of the compass was found by azimuths to be 8° 18′ E.; and the distance from the penal settlement on the Brisbane, which bore by compass about N.E., was estimated at seventy-five statute miles.

Although very recent traces of natives were observed in different parts of the Vale, only a solitary aborigine was seen, who, in wandering in quest of food, chanced to pass the tents; immediately, however, upon an attempt of one of the party to approach him, he retired in great alarm to the adjacent brushes at the foot of the boundary hills, and instantly disappeared. It therefore seemed probable that he had not seen white men, and possibly might never have had any communication with the natives inhabiting the country on the eastern side of the dividing range, from whom he could have acquired such information of the existence of a body of white strangers on the banks of the Brisbane River, and their friendly dispositions towards his countrymen.

In the progress of the expedition northerly, it was remarked, that the plants of those portions of the interior lying between the parallels of 32° and 28° S., differ but little from the characteristic vegetation of the temperate parts of the colony generally—the many unpublished species, which were discovered in the course of the journey belonging for the most part to genera characterizing the Flora of the colony and country immediately adjacent.* Upon gaining the parallel of 28° S., however, under the meridian of 152° E., a very decided change takes place in the vegetable productions. The brushes which densely invest the sides of the lateral ranges, were, on examination, found to be plants more usually to be observed in the intertropical parts of Australia.

Mr Cunningham, on the 16th of June, resumed his journey to the southward; for, notwithstanding the benefit his horses had derived from rest and good pasture during the stay of the party in Logan's Vale, they were all exceedingly weak, and his provisions so considerably reduced, that he was reluctantly compelled to relinquish the tour he had originally contemplated towards the western marshes into which the Macquarie River drains, and the more particularly as the appearances of the weather at the change of the moon had led him to apprehend that a period of heavy rain was about to succeed the protracted season of drought. On quitting Logan's Vale, they commenced their journey through a fine open forest country, abounding in excellent pasture, and tolerable timber, and watered by a reedy creek running to the westward. In about nine miles they reached the north-eastern skirts of Canning Downs, which, in pursuing their course, they crossed at a part where their breadth did not exceed two miles. After passing through a heavily timbered forest, but slightly elevated above the mean level of the Downs, upon effecting fifteen miles they halted at a chain of small ponds, furnishing on their margin some tolerable grass for their horses. On the 18th, the party reached a marshy plain, which appeared to stretch several miles to the base of a lofty range of mountains at east, from whence ran a brisk creek to the westward. After penetrating for about six miles through an uninteresting forest of red gum, (*Eucalyptus robusta*) they at length reached the confines of a broken and mountainous country, exhibiting a geological character not previously met with in any stage of the journey. The rock was a very hard granite, in which the quartz, greatly preponderating, was unusually large. Their journeying to the end of the month was through a country of a most impracticable nature, composed of a series of glens and ridges of a most rugged description, through which they had extreme difficulty in leading their wearied packhorses. On the 30th, they reached the banks of the Dumaresq River, about fifty miles nearer its source than where they crossed it on their outward bound tract. The height of the river was 1040 feet above the level of the sea, showing a mean fall of four feet per mile between the two fords. The precipitous character of the country in a southerly direction, apparently continuing to some distance, induced Mr Cunningham to alter his course to the south-west, in the hopes of gaining a more easy route for his horses to travel over. On the 9th of July, they crossed their outward tract in lat. 29° 30′ S., and the next day (10th), came on the banks of a large stream which received the name of the Gwydir. On the 16th, they reached the ridges overlooking a level wooded country, extending apparently to Liverpool Plains, and where they experienced extreme difficulty in descending with their weakened packhorses to the level of those vast plains, a descent of about 1200 feet; however, by great precaution, this was accomplished in safety, after a journey of two hours of great anxiety, and then with a quickened pace, they prosecuted their course southerly through a forest-ground abounding in kangaroos.

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* The genus *Acacia* appears to have been found most abundant, for not less than thirty species of this elegant race were found during the expedition.

On the 19th, they crossed the Field River of Oxley, and reached Liverpool Plains on the 21st, and finally returned to their starting-point Segenhoe, on Hunter's River, on the 28th, having, in an absence of thirteen weeks, travelled upwards of eight hundred miles. The result of this journey was the acquirement of a knowledge of a portion of the interior lying north from the parallel of 31° S., to almost the shores of Moreton Bay, in 27° 30′ S., and between the meridian of 150° E. and the coast line.*

A remarkable feature in their tour was the paucity of inhabitants in the varied districts they travelled over. Five times only, in the prosecution of their journey were the aborigines seen, when, either in consequence of their timid dispositions, and the great alarm excited by the appearance of the packhorses, or other circumstances, Mr Cunningham's communication with them was entirely prevented, and no remark on their persons or their language could be made. The few who suffered the travellers for the moment to view them at a distance appeared to be tall and well-formed, and of rather athletic make; possessing the same description of weapons as the aborigines, who more fully peopled the shores in the vicinity of Port Jackson; with whom, as being of the same primitive stock, they appeared to be fully identified, not simply in their general conformation, but in their wandering unsettled habits, and the full exercise of those savage instincts, by which they find their food in the trees, and their path through the forest.

Having afforded his people and horses a week's rest at Segenhoe, Mr Cunningham quitted that station on the 5th of August, with the intention of returning to the colony by the way of Bathurst, owing to the broken rocky character of the country in the vicinity of Mount Dangar, round the south-western base of which eminence their course lay. It was not until the 16th that they reached their old encamping ground on the plains of Daby, on the Cugeegong River, and on the 23d they arrived at Bathurst, where it was found necessary to give the horses a further rest, and, on the evening of the 31st, they finally arrived safely at Paramatta. Mr Cunningham waited on the Governor the next day, and laid before his Excellency a rough outline of the country through which he had penetrated, north of Liverpool Plains; and gave his Excellency some brief observations on the general results of the journey, with the whole of which the Governor expressed his entire satisfaction. On the delivery of a report of his late journey, accompanied by a map of the new discoveries, Mr Cunningham received the following letter from the Governor's private secretary:—

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* For more lengthened details of this journey, *vide The Australian Quarterly Journal* for January and April, 1828. *The Journal of the Royal Geographical Society of London,* Vol. II., p. 99, 1832; and *Proceedings of the Geological Society of London,* Vol. II., p. 109, 1834-5.

"GOVERNMENT HOUSE, PARAMATTA,
17*th November*, 1827.

"SIR,—I am directed to acquaint you, that his Excellency the Governor has forwarded the journal of your late expedition into the interior of this colony, with its accompanying map, to the Right Honourable the Secretary of State. His Excellency has been unwilling to delay transmitting to his Lordship the result of so interesting a journey, through an extensive portion of hitherto unknown interior; and he has had pleasure in bearing testimony to the zeal and enterprise with which it was undertaken, as also to the judgment and success with which it has been performed.

"I have the honour to be, Sir,
"Your most obedient and most humble Servant,
"T. DE LA CONDAMINE."

"To A. Cunningham, Esq."

The remaining portion of this year, and the months of January and February 1828, were employed in journeys to Bathurst, the Pine (*Callitris*) ridges on the banks of the Macquarie below that settlement, and the forests of Illawarra, for seeds and epiphytal *Orchideæ* for transmission to the Royal Gardens. At the same period, Mr Cunningham renewed a request, some time previously made, that a termination might be appointed for his labours in the southern hemisphere : he most touchingly says :—

"May I be permitted again, most earnestly and respectfully to beg you, to weigh duly the several points submitted to your consideration, in my letter of March last, and in again urging my great desire to visit my native land. I trust with the utmost confidence, that a service of fourteen years, in the arduous occupation of botanical collector for his Majesty's Gardens, will assuredly obtain for me the permission to return to England, in the earlier months of the next year; and, looking forward to the close of my labours in the colony at that period, it is my fullest intention to employ myself during the current year, in the performance of the several duties of my appointment; and (particularly as the season may favour me,) that of collecting living specimens of such plants as are still desiderata of the Royal Gardens. To this end, it is my design (in obedience to your desire,) to make my voyage to Moreton Bay in the cooler months of the year, in order to take up, for establishing in boxes, young plants of the *Araucaria* or Brisbane Pine, so frequent on the river bearing that name, as well as those of *Flindersia*, *Carissa*, *Hoya*, and many other interesting genera, not known to exist, indigenously, to the southward of that penal settlement. Several botanical excursions to various parts of the colony, and my visit to Van Dieman's Land, will employ me to the close of the year; at which period, although I may not have received any instructions, I nevertheless shall be induced to hope, that the consideration of the length of the service in which I have been steadily engaged, independently of the bodily indisposition contracted during its progress, and under which I so frequently labour, will at once remove any objection to my quitting the colony that might otherwise exist, and justify me fully in taking my passage for England, in one or other of the next year's wool ships, in charge of such collections as circumstances and season may have enabled me to form."

To be continued.

XIII.—CONTRIBUTIONS *towards a* FLORA *of South America.* —*Enumeration of Plants Collected by* MR SCHOMBURGK, *in British Guiana.*—By GEORGE BENTHAM, ESQ., F.L.S., &c., &c.

(*Continued from page* 133 *of the present Volume.*)

PROTEACEÆ.

(*Determined and described by* DR KLOTZSCH.)

682. Rhopala *media, R. Br. Linn. Trans.* xx. *p.* 191. —French Guiana, *Leprieur, Herb. Par. n.* 76, 77, and 78.

683. R. *obtusata, Klotzsch, Linnæa, v.* xv. *p.* 54.—Islands of Rio Negro, *Schomburgk.*—This was one of Schomburgk's single specimens, and was numbered 215, as quoted in the *Linnæa,* but is not 215 of the generally distributed collection.

684. Andripetalum *sessilifolia, Klotzsch, Linnæa, v.* xv. *p.* 53.—Roraima chain, *Schomburgk.*

685. A. *rubescens, Schott.*—*Klotzsch, l. c.*—On the brook Anna-y.—British Guiana, *Schomburgk, n.* 69.

PIPERACEÆ.

(*Determined and described by* DR KLOTZSCH).

686. Artanthe (Fruticosæ), *apiculata,* (Klotzsch, n. sp.); ramulis petiolisque unifariam pubescentibus, foliis oblongo-ellipticis breviter acutis penninerviis sexuncialibus basi inæqualiter attenuatis utrinque glaberrimis subcoriaceis pellucide glanduloso-punctatis, spicis erectis 6, linearibus apice apiculatis nudis foliis multo brevioribus, bracteis transverse rhomboideis glabris cinereis, pedunculo petiolo parum breviore. This species approaches nearest to *Schilleria obovata,* and *S. heterophylla* of Professor Kunth. (*Klotzsch*).—Island of Ooropocary on the Essequibo, *Schomburgk, n.* 53.

687. A. (Fruticosæ) *Olfersiana, Klotzsch.*—Steffensia Olfersiana, *Kunth, Linnæa, v.* xiii. *p.* 645.—Alluvial soil, British Guiana, *Schomburgk, n.* 494.—French Guiana, *Herb. Par. n.* 191.

688. A. (Fruticosæ) *corylifolia, Klotzsch.*—Schilleria cory-

lifolia, *Kunth, Linnæa, v.* xiii. *p.* 699.—Massaroony on the Essequibo, *Schomburgk, n.* 1.

689. A. (Caulobryon) *guianensis* (Klotzsch, n. sp.); caule herbaceo bipedali sulcato glabro, foliis ovato-lanceolatis acuminatis glabriusculis triuncialibus margine evanescente hispidis membranaceis pellucide glanduloso-punctatis læte viridibus, spicis clavatis obtusis 4-linearibus pedunculo sparsim hispido brevioribus, bracteis reniformibus pedicellatis reflexis glabris. (*Klotzsch*).—Amongst rocks on the Rio Branco, *Schomburgk, n.* 901.

The following are the characters given by Dr Klotzsch to the new subgenus of *Artanthe*, to which he has given the name of *Caulobryon*, derived from *καῦλος, a stem,* and *βρύον*, a *catkin.*

Flores hermaphroditi, confertissime amentacei, bracteis reniformibus pedicellatis reflexis suffulti. Stamina 2, breviter pedicellata; antheræ magnæ, biloculares, loculis oppositis per rimam longitudinalem verticaliter dehiscentibus. Germina atra, ovoidea, minutissima, sessilia, unilocularia. Stigmata tria, erecta, sessilia.—Herbæ Americæ meridionalis, facie *Peperomiæ,* pedales aut sesquipedales, foliis alternis, petiolatis, membranaceis, venosis, nervo medio crasso opposito interdum alternos ramos emittente, basi equalibus, petiolis stipulaceo-alatis, stipulis persistentibus. Amenta brevia, cylindrica, longe pedunculata, oppositifolia.

690. A. (Caulobryon) *Schomburgkii* (Klotzsch, n. sp.); caule herbaceo sesquipedali leviter striato glabro, foliis ovato-lanceolatis apice attenuatis mucronatis 4-uncialibus basi subcordatis utrinque glabris margine hispidulis membranaceis glanduloso-punctatis saturate viridibus, petiolis puberulis, spicis clavatis breviter apiculatis 8-linearibus pedunculo pubescenti-hispido brevioribus, bracteis parvis orbicularibus pedicellatis glabris. (*Klotzsch*).—Currassawaka, *Schomburgk, n.* 696.

691. A. (Caulobryon) *oblongifolia* (Klotzsch, n. sp.); caule herbaceo striato glabro, foliis oblongis utrinque glabris basi apiceque attenuatis 3—4-uncialibus glanduloso-punctatis

membranaceis supra saturate viridibus subtus pallidis, petiolis glabris, spicis ovalibus obtusis 3-linearibus pedunculo glabro triplo brevioribus, bracteis parvis orbicularibus pedicellatis margine puberulis. (*Klotzsch*).—Sierra Parime, *Schomburgk*.

692. Heckeria *peltata, Kunth, Linnæa, v.* xiii. *p.* 565.—Potomorphe peltata, *Miguel Comment. Phytogr. fasc.* ii. *p.* 37. —On the Rio Negro, *Schomburgk, n.* 954.

693. Micropiper *pellucidum, Miguel l. c. p.* 39.—Piper pellucidum, *Linn.*—Sands of the Rio Negro, *Schomburgk, n.* 939.

(*To be continued.*)

XIV.—*Notes on* MIMOSEÆ, *with a short Synopsis of Species.* By GEORGE BENTHAM, ESQ., F.L.S.

ON the occasion of describing the *Mimoseæ* of Schomburgk's Guiana collection, (vol. ii. p. 127, of this work), I suggested the adoption of several new genera, but had not then examined a sufficient number of species to define them with any precision. Since that time the whole of Sello's Brazilian collection of this suborder has been intrusted to me for publication, by the administrators of the Royal Herbarium of Berlin, and I have also had opportunities of examining various other sets, including the whole of this portion of Sir W. J. Hooker's rich herbarium. Having subjected all the materials, thus placed at my disposal, to a detailed revision, I have now to offer the following notes on the genera and species composing this beautiful suborder.

Before entering however into descriptive details, some preliminary explanations may be necessary, relating to some of the terms used in characterizing *Mimoseæ*, and applied by different writers in different senses. Thus, for instance, in describing the bipinnate leaf of most *Mimoseæ*, some of the most distinguished botanists apply the term *pinnæ*, to the primary divisions of the leaf, and that of *foliola*, to the secondary or ultimate divisions, whilst others, on the contrary, call the former *foliola*, and the latter *pinnæ*. Again, the adjective *jugus*, with a numeral (as 4-*jugus*, 5-*jugus*, *&c.*), in some works, designates the number of pair of the organ to which it is applied; and, in others, means the number of pair of parts of which it is composed; and, in general systematic works and compilations, by the mixture of the phraseology copied from different authors, the descriptions are sometimes rendered almost unintelligible.* I have uniformly adopted the phraseology usually followed by De Candolle, giving the name of *pinnæ* to the primary divisions, and of *foliola* to the ultimate divisions, and indicating by the numeral attached to —*jugus*, the number of pair of the organ to which this adjective is applied. I have also designated by *petiolus communis*, the *whole* of the stalk to which the pinnæ are affixed, not (as is done by Kunth), that part only which is below the lowest pair of pinnæ, and by *petiolus partialis* I have meant the whole of the stalk to which the foliola are attached.

I have used the words *spinæ* and *aculei*, in the usually received sense, applying the former to abortive organs assuming that form, and the latter to those prickles which are mere productions of the cuticle. Thus *spinæ stipulares* are prickles produced by the abortion, or transformation of stipules; *aculei caulini*, or *aculei petiolares*, are prickles produced by the cuticle of the stem, or of the petiole; it has therefore appeared to me necessary to suppress altogether the expression *aculei stipulares*, applied, not to aculei growing on the stipules, but to the not uncommon aculei arising from the stem in pairs, one immediately under each stipule, and which have so often been mistaken for *spinæ stipulares*.

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* Thus, supposing in the characteristic phrase, the bipinnate leaves were to be described as consisting of four pair of parts, each of them divided into six pair of a secondary order, each of these again being of an ovate form; the Latin phrase would be thus worded :—

By LINNÆUS : *foliis bipinnatis, partialibus 4-jugis, propriis 6-jugis ovatis.*

By JACQUIN : *foliis bipinnatis partialibus 4-jugis, propriis 6-jugis, pinnulis ovatis.*

By L'HERITIER : *foliis bipinnatis 4-jugis, pinnulis 6-jugis, foliolis ovatis.*

BY MARTIUS : *foliis bipinnatis 4-jugis, foliolis 6-jugis, pinnis ovatis.*

By DE CANDOLLE : *foliis bipinnatis, pinnis 4-jugis, foliolis 6-jugis, ovatis.*

Each of which forms of expression is more or less adopted to this day. Even De Candolle in his *Prodromus*, has mixed up several of them in his specific character of the genus *Mimosa* for instance.

It is more difficult to fix on an appropriate nomenclature for the various appendages to the petioles of *Mimoseæ*, which, on some occasion or another, have received the name of *glands*, although very different from each other in their origin and importance, as will be seen from the following enumeration :—

1. The base of the petiole, whether common or partial, as well as the petiolule of the leaflet, is often thickened, and of a glandular or somewhat cartilagineous consistence, something analogous to what the French term a *bourrelet*. This portion of the stalk is by some called a *gland;* but it appears to me that the name is thus misapplied; nor do I see any occasion for giving a special name to what is neither an organ of itself, nor yet a *definite* portion of another organ.

2. I have, with most botanists, considered as true petiolar glands, those which, when they exist, are always to be found on the upper surface of the common or partial petioles. They are usually sessile, oblong, ovate, or orbicular, depressed, concave or convex, and single, either below the lowest pair of pinnæ alone, or one between, or a little below, one two or more pair of pinnæ or leaflets, beginning with the extreme pair. When pinnæ are not exactly opposite, it sometimes, but rarely, happens, that there are two of these glands together, one under each pinna.

3. A small point terminates the petioles, whether common or partial, in all or nearly all *Mimoseæ*. It is usually setiform, though sometimes short and thick, and occasionally almost foliaceous, sometimes apparently continuous with the petioles, at others falling readily off. This point has by some been termed a gland; but it would appear, erroneously

It may possibly be the rudiment of a terminal pinna or leaflet; but as there is no evidence beyond its position, to show that it is so, I have been unwilling to give it any other name than *seta terminalis*.

4. Between the pinnæ of each pair, in some species of *Mimosa*, there is on the common petiole, a tubercle or seta often similar to the *seta terminalis* of the same leaf, occasionally longer and even thornlike. This also has sometimes been described as a gland, at others as a prickle; but is always very different in appearance, as well from the petiolar glands, as from the other prickles of the petiole. The regularity of insertion of these organs, when they appear, gives them some importance; yet, as there is nothing to show their real nature, I have not noticed them by any special name, but called them *setæ* or *tuberculi*, according to their appearance.

5. Near the base of the partial petioles of many species, especially of the genus *Mimosa*, are a pair of small setiform or foliaceous appendages, to which, from their situation, I have applied the name of *stipellæ*, as being in many respects analogous to the *stipellæ* of the *Cæsalpinieæ*. These also are sometimes described as glands.

A strange mistake has occurred (as has I believe been already pointed out by Endlicher), in giving the name of *replum* to the thickened sutural margins of the pod of *Mimosa*, *Entada*, and *Schranckia*, which persist after the remainder of the valves have detached themselves and fallen out. The word is found in Vitruvius, and was thus applied by botanists on the supposition that that writer meant by it the architrave or frame of a door; but it has been shown that it was rather the leaf of the door that was so called. At any rate, it appears to me that the term is unnecessary, the word *margo*, of which the meaning is clear, answering the purpose perfectly well.

The *Mimoseæ*, distinguished from *Cæsalpinieæ*, by their perfectly regular and valvate calyx and corolla, and hypogynous corolla and stamens, may be generally divided into two large tribes, the *Eumimoseæ*, with definite stamens and pollen not agglomerated, and the *Acacieæ*, with indefinite stamens and pollen collected into four or six masses in each cell, each tribe containing many hundred species. To these must be added about half a dozen species, forming three or four anomalous genera, but little resembling each other; but, inasmuch as they are all as it were intermediate between *Cæsalpinieæ* and *Mimoseæ*, they may be considered as forming a distinct tribe under the name of *Parkieæ*, already given to it by Wight and Arnott, who established it on the characters pointed out by Brown. With this tribe I now commence the enumeration of the species of *Mimoseæ*, which have come under my observation. I have added short specific characters only, reserving the detailed descriptions for my *Leguminosarum Genera et Species*.

Tribe I. PARKIEÆ. *W. et Arn.*

Calyx v. corolla æstivatione leviter imbricata. Stamina definita cum corolla perigyna.

1. FILLÆA. *Guillem. et Perrot.*

Calyx turbinatus, dentibus 5, æstivatione levissima imbricata, mox aperta. Petala 5, calycem vix excedentia, perigyna, æstivatione subvalvata. Stamina 10, perigyna, libera, exserta, omnia fertilia. Antheræ non glanduliferæ. Granulæ pollinis numerosissimæ. Ovarium stipitatum, lanatum. Stylus conicus, obtusus. Legumen oblongum, compressum, valvis 2 crasso-coriaceis dehiscens, intus inter semina pulposum.—Arbor. Folia bipinnata, eglandulosa. Pinnæ paucijugæ. Foliola pauca, majuscula, alterna. Flores laxe cylindraceo-spicatæ, spicis paniculatis.

Sp. unica; *F. suaveolens*, Guillem. et Perrot. Fl. Seneg. i. 242. t. 55.—Senegambia.

This tree, figured and described in detail in the work quoted, although it has very nearly the estivation of the true *Mimoseæ*, is perhaps on the whole nearer to the *Cæsalpinieæ* in general, than are either of the other genera of *Parkieæ*. In habit it is considerably removed from any, unless perhaps some affinity may be observed with some *Gleditschiæ*. There is, however, the genus *Erythrophleum* of Afzelius, from the same country as the *Fillæa*, which from the few words of Brown in his appendix to Oudney (*Verm. Schr. v.* iv. *p.* 55.), and the short characters given by Don (*Gen. Syst.*), and copied into Endlicher's *Genera*, must be very near to it. As I have not seen the plant, and cannot from the above sources state any point in which it differs from *Fillæa*, I here omit it as a separate genus; but should the two ultimately prove to be one and the same, the name of *Fillæa* must give way to the older one of *Erythrophleum*.

II. PARKIA. *R. Br.*

Calyx cylindraceus limbo bilabiato labio superiore bifido, inferiore trifido, æstivatione imbricativa. Petala 5, medio coalita v. libera, æstivatione subimbricata. Stamina 10, perigyna, basi monadelpha. Antheræ non glanduliferæ. Massæ pollinis in quoque loculo biseriatæ, subdefinitæ. Ovarium glabrum. Legumen stipitatum, lineare v. oblongum, compressiusculum, valvulis crasso-coriaceis, intus pulpa semina obtegente farctum.—Arbores. Folia bipinnata, petiolo pauci-glanduloso, pinnis foliolisque numerosissimis. Pedunculi axillares v. racemosi, longissimi, penduli. Flores ad apicem pedunculi densissime capitato-spicati, numerosissimi, superiores hermaphroditi, inferiores masculi.

1. Parkia *biglobosa*, pinnis 16—40-jugis, receptaculo florum oblongo-clavato.—Tropical Asia and Africa, and thence carried out by the Negroes to tropical America.

As far as I have seen, the distinctions between the specimens from various parts of Asia, and from tropical Africa, are too slight and variable, to serve as characters of species. The petiolar gland appears to be convex or concave, according to the age of the leaf: its being double or single is probably accidental, and the precise number, both of pinnæ and leaflets is very uncertain. On comparing the Senegambian specimens of *Parkia Africana*, Br. (fully described by Guillemin and Perrottet), with those of *P. biglandulosa*, W. and Arn., from the East Indian Peninsula, of *P. Brunonis*, Grah. in Wall. Cat. n. 5288, and *P. Roxburghii*, G. Don, from the Calcutta Garden, and with the description of the East Indian specimens by Arnott, Roxburgh, &c., of the Timor specimens by Decaisne, (which he refers to *P. Roxburghii*, and associates to it as a synonym *Inga Timoriana*, DC.); and of the Philippine Islands tree described by Blanco under the name of *Mimosa peregrina;* they all agree in essential particulars. The only discrepancies are in the colour of the flower, which is said by Roxburgh to be yellow in the Sylhet plant, and by Guillemin to be purple in the African one, and in the breadth of the pod, which is variously given, from half an inch to an inch and a half. All agree in its general form, length, number of seeds, &c. Unable therefore to discover any differences that may not be referrible to mere varieties, I have included them all under the original specific name.

2. P. *platycephala*, (sp. n.), pinnis 6—12 jugis, receptaculo florum depresso-globoso, late capitato.—Brazil, Prov. of Cearà, *Gardner*, n. 1582, Prov. Bahia, *Blanchet*, n. 2868.

This is really a well-marked species, with much the foliage of *P. biglobosa;* but the receptacle of the flowers is broader than it is long, and the pod is not four times as long as broad.

Inga *pendula*, and I. *filicina*, Willd., Spec. 4. p. 1025, may perhaps be species of *Parkia*.

The genus *Parkia* is in many respects allied to *Inga*, and to the genera separated from it, especially in the monadelphous stamens, and the pollen masses, which, though numerous, are biseriate, and perhaps definite in number, whilst the form of the calyx and the estivation is very different from all *Mimoseæ*. There is however no one genus of *Cæsalpinieæ* which can be said to be nearly allied to it.

III. PENTACLETHRA, *Benth.*

Flores hermaphroditi v. polygami. Calyx campanulatus, dentibus 5 brevibus, æstivatione imbricativa, corolla profunde 5-fida, petalis æstivatione valvatis, basi connatis subperigynis. Stamina basi monadelpha et corollæ adnata, 5 fertilia, petalis alterna, exserta, antheris ovatis glandula decidua superatis; 5, 10, v. 15, petalis opposita, filiformia, ananthera. Annulus 10-crenatus intra stamina, tubo stamineo adnatus. Ovarium subsessile. Stylus filiformis, apice breviter dilatatus, concavus, margine stigmatifero.—Arbores. Folia bipinnata, petiolis eglandulosis, pinnis foliolisque multijugis nitidis. Stipulæ lanceolatæ, parvæ. Stipellæ minutæ, setaceæ. Spicæ elongatæ ad apices ramorum solitariæ v. plures. Flores sessiles, albido-flavicantes, suaveolentes.

A remarkable genus, allied on the one hand to *Dimorphandra* among *Cæsalpinieæ*, on the other hand to several genera of *Adenantheræ*.

1. P. *filamentosa*, (Benth. in Hook. Journ. Bot. 2. 127.) pinnis 10—15 jugis, foliolis 30—50 jugis lineari-falcatis, staminibus sterilibus 5, corolla multo longioribus.—British Guiana, *Schomburgk;* St Vincents, *Guilding.*

2. P. *brevifila* (Benth. l. c.) pinnis 10—15 jugis, foliolis 30—50 jugis lineari-falcatis, staminibus sterilibus 5 corolla brevioribus.—Borba on the Rio Negro, *Langsdorff.*

3. P. *macrophylla*, (sp. n.), pinnis sub 10-jugis, foliolis 8—15-jugis oblongo-rhombeis obliquis, staminibus sterilibus 10—15 tenuissimis.—Folium unicum tantum vidi amplum, foliolis plerumque pollicaribus 4—5 lin. latis. Spicæ 4—5-pollicares, tenuiores quam in præcedentibus. Flores minores. Stamina fertilia corolla duplo longiora, glandula antherarum parva. Filamenta sterilia tenuia, corolla multo longiora, sed in fundo corollæ plicato-crispa, ita ut lacinias corollinas non adæquant. Legumen pedale, lignosum ex Heudelot, ipse non vidi.—Rio Nunez in tropical Africa, *Heudelot, n.* 825.

Tribe, II. EUMIMOSEÆ.

Calyx et corolla æstivatione valvata. Stamina definita, numero petalorum æqualia v. dupla, una cum petalis hypogyna. Filamenta libera v. basi brevissime inter se et cum petalis connata. Pollinis granulæ numerosissimæ, distinctæ.

Subtribe, I. ADENANTHERÆ.

Antheræ glandula stipitata caduca terminatæ.

Since the old genus *Mimosa* was first broken up by Willdenow, the characters of the genera adopted by modern botanists have been chiefly derived from the form and consistence of the pod: this organ is however so seldom to be seen in herbaria, and, when seen, often so doubtful as to both of those characters, as to have produced much confusion in the suborder. In seeking for some characters which should possess more fixity, it appeared to me that the stamina would afford a primary division both constant and definite, and at the same time easy to observe. The definite stamina have always, in the species I have examined, (excepting perhaps the anomalous genus *Parkia*,) granular pollen, and the indefinite stamens agglomerate pollen, and this division does not appear to break up any genera otherwise natural. The subdivision of *Eumimoseæ*, upon the presence or absence of the curious stipitate gland on the anther, is perhaps more artificial, but is always constant in the same genus, excepting perhaps one species of *Prosopis*, where I have not found it, as in all others of that genus.

With regard to the ultimate reduction to genera, I have been obliged, in many cases, to follow previous authors, in relying on the pod alone, as otherwise it would have been necessary to combine old Linnæan genera, which are not unnatural. It must, indeed, be admitted, that in some cases these distinctions are troublesome, and far from satisfactory; but too many species are as yet unsufficiently known, to enable me to propose any better system.

IV. Entada, *Linn.*

Calyx campanulatus, brevissime 5-dentatus. Petala 5, libera v. leviter cohærentia. Stamina 10. Antheræ glanduliferæ. Legumen lineare, plano-compressum, suturis incrassatis persistentibus marginatum, valvulis transverse articulatis, articulis monospermis, a margine secedentibus, indehiscentibus v. sæpius endocarpio ab exocarpio recedente spurie dehiscentibus. Frutices sæpius altissime scandentes subinermes. Folia bipinnata, pinnis jugi supremi sæpe in cirrhos mutatis. Stipulæ parvæ setaceæ. Florum spicæ tenues, solitariæ v. geminæ, axillares v. in paniculam terminalem dispositæ. Flores singuli sessiles, plerique hermaphroditi, pauci tamen fructiferi.

1. Entada *scandens*, inermis, foliis cirrhiferis, pinnis 1—2-jugis, foliolis 2—5-jugis ovatis v. oblongo-obovatis obtusis acuminatis emarginatisve sæpius obliquis supra nitidis, subtus glabris puberulisve, spicis elongatis solitariis subgeminisve longe racemosis.—Mimosa scandens, *Linn.*—Tropical America, Africa, and Asia.

The *Mimosa scandens* of Linnæus, the plant furnishing the well-known gigantic pod, was separated by De Candolle into three species. Wight and Arnott have already shown (*Prodr. Fl. Penins. Ind. Or.* i. 267.) that the two East Indian ones E. *Pursætha, DC.*, and E. *monostachya, DC.*, are the same species in different states. The West Indian one, E. *gigalobium, DC.*, has been supposed to differ in the number of stamens described by Swartz, as twenty or twenty-five; but this must be a mistake. M'Fadyen, who saw the plant living, expressly describes it as having but ten. The *Adenanthera scandens*, Forst. or *Entada adenanthera, DC.*, is assuredly also this same species which Sprengel has divided (Syst. 2, 325,) into two only, which he calls *Entada Parrana*, and *E. Rheedii.*

2. E. *polystachya* (*DC. Leg. Mim.*, 434. *t.* 61, 62.) inermis, foliis demum cirrhiferis, pinnis 2—6-jugis foliolis 6—8-jugis oblongis obtusis emarginatisve glabris v. subtus pubes-

centibus, spicis brevibus plerisque geminis in racemo longo paniculæformi densis,—*Mimosa Entada*, Linn., according to the specimen in his herbarium, though in his *Species Plantarum* he appears to have mixed it up with the E. *scandens*.—West Indian islands, and probably also the coast of Guiana. I do not see any character to distinguish from it the *Mimosa chiliantha*, G. F. W. Meyer, or *Entada chiliantha, DC.*

3. E. *africana, Guillem. et Perr. Fl. Seneg.* v. i. p. 233.—Unknown to me.

4. E. *polyphylla*, (Benth. in Hook. Journ. Bot. ii. 133,) inermis, foliis non cirrhiferis? pinnis 4—8-jugis, foliolis 10—20-jugis oblongis obtusis emarginatisve subtus pubescentibus, spicis brevibus plerisque geminis in racemo longo paniculæformi densis.—North Brazil, *Poeppig, Langsdorff;* British Guiana, *Schomburgk.*

5. E.? *natalensis*, ramulis petiolisque tomentellis hinc inde uncinato-aculeatis, pinnis 5—7-jugis, foliolis 9—15-jugis oblique oblongis obtusis glabris puberulisve, petiolo hinc inde glandulifero spicis axillaribus 2—3-nis in paniculam foliatam dispositis.—*Mimosa spicata*, E. Mey. Comm. Pl. Afr. Austr.—Port Natal, and banks of the Basche river in S. Africa, *Drège*.—The flowers and anthers are entirely those of an *Entada*, not of a *Mimosa*. I have not seen the ripe fruit, but, in specimens far advanced, the valves cohere so close together, that I cannot imagine them to open as in *Mimosa*, although I see no signs of the endocarp detaching from the exocarp as in *Entada*.

The plant I published, vol. ii., p. 133 of this Journal, as *Entada? myriadenia*, differs from the genus in its pentandrous flowers, without the stipitate gland to the anther. On the other hand, the corolla and the oblong anther remove it from *Mimosa*. It probably forms a distinct genus allied to some groups of *Mimosa*, but not having seen the fruit, even young, it is impossible to characterize it.

V. PLATHYMENIA, *Benth.*

Flos *Entadæ*, sessilis. Legumen stipitatum lato-lineare,

planum, valvulis submembranaceis dehiscentibus, endocarpio membranaceo excepto, quod circa semina persistit et inter semina transversim divisa est.—Frutices? v. arbores parvæ, Brasilienses, inermes. Folia bipinnata, eglandulosa, foliolis ellipticis. Spicæ supra-axillares, superiores paniculatæ. Glandula in ramo inter spicam et folii axillam sæpius adest. Ovarium villosum. Legumen glabrum.

1. P. *reticulata*, (sp. n.), ramis foliisque laxe pubescentibus v. demum glabratis, pinnis 4—8-jugis, foliolis 10—12-jugis ellipticis retusis reticulato-venosissimis, spica pubescente.—Minas Geraes, *Pohl*, *Langsdorff*, *Claussen*.—Petiolus communis semipedalis; pinnæ tripollicares; foliola sæpius alterna 6—9-lin. longa, 3—4-lin. lata. Spicæ 3 poll. longæ. Calyx corolla subtriplo brevior. Stamina breviter exserta. Legumen demum 5 poll. longum, 10—12-lin. latum. Semina ovato-compressa transversa, funiculo filiformi appensa.

2. P. *foliolosa*, (sp. n.), ramis petiolisque glabris, pinnis 4—12-jugis, foliolis 12—20-jugis oblongo-ellipticis obtusis retusisve glabris v. vix subtus pilosulis, spica glabra.—Near Crato, Prov. Cearà, *Gardner, n.* 1589.—Foliola dimidio fere minora, angustiora quam in præcedente, leviter venulosa.

This genus, indicated vol. ii., p. 134 of this Journal, is intermediate as to the fruit between *Entada* and *Piptadenia*, with the flowers of both genera, and the habit nearly of *Piptadenia*.

VI. PIPTADENIA, *Benth.*

Flos *Entadæ* sessilis. Legumen stipitatum v. rarius sessile, lato-lineare, planum, membranaceum v. subcoriaceum, bivalvatim dehiscens, intus uniloculare, epulposum. Semina compressa, funiculo filiformi appensa.—Frutices v. arbores Austro-Americana, inermia v. aculeata. Stipulæ parvæ, setaceæ. Folia bipinnata, pinnis foliolisque sæpius multijugis. Glandulæ petiolares prope basin petioli, infra pinnas supremas et interdum inter v. infra foliola suprema, rarius deficientes v. obscuræ. Flores parvi sessiles albi v. virescentes in sectionibus i. et ii. spicati, spicis axillaribus solitariis binisve superioribus paniculatis; in sectione tertia capitati. Stamina exserta.

This genus, with the flowers of an *Entada*, has the fruit of an *Acacia*. It differs from *Adenanthera* in the thinner pod, flat seeds, sessile smaller flowers, and longer stamens.

Sect. I. EUPIPTADENIA. *Legumen continuum, valvulis tenuiter membranaceis lævibus reticulatisve. Frutices, v. arbores parvæ, floribus spicatis.*

* LATIFOLIÆ; *foliis ovatis oblongisve, ovario stipitato villoso.*

1. P. *latifolia*, ramis petiolisque glabris aculeatis, pinnis 3—4-jugis, foliolis 2—3-jugis obovatis orbiculatisve glabris. —*Acacia fruticosa*, Mart. Herb. Fl. Bras., 107.—Frutex scandens, aculeis uncinato-recurvis. Foliola majora pollicem longa, 9 lin. lata. Spicæ virescentes 2—4 poll. longæ. Petala demum libera, revoluta.—Woods of Corcovado, and elsewhere near Rio Janeiro; *Martius, Pohl, Vauthier, (n. 185,) Guillemin*, and others.

2. P. *laxa*, ramis petiolisque glabris puberulisve, aculeis sparsis parvis, pinnis 2—4-jugis, foliolis 4—7-jugis ovali-v. obovato-ellipticis oblongisve glabris v. subtus pubescentibus. —Affinis P. *latifoliæ*. Foliola numerosiora, minora, angustiora, sæpius pubescentia. Legumen 5—6-poll. longum, 10—11-lin. latum.—*Mimosa fruticosa*, Vell. Fl. Flum. 11. *t.* 6.—Rio Janeiro, *Gomez*; Bahia, *Blanchet*, 1551, and 1602, and in the Brazilian collections of Pohl and Sello.

3. P. *Guianensis*,—*Mimosa Guianensis*, Aubl. Pl. Guian. 2, 938. t. 357. *Acacia Guianensis*, Willd., DC., etc.—I have not seen this species which appears to differ from P. *laxa*, chiefly in the want of prickles and the smooth leaves.

** ANGUSTIFOLIÆ, *foliolis linearibus v. oblongo-linearibus parvis, ovario stipitato villoso.*

4. P. *macradenia*, (sp. n.), ramulis petiolisque tomentosis hinc inde aculeatis inermibusve, pinnis 6—10-jugis foliolis

multijugis linearibus falcatis ciliatis, nervo obscuro parum excentrico, spicis tomentosis. Variat ramis nunc crasse suberoso-alatis, nunc vix angulatis. Glandula petioli communis interdum fere 3 lin. longa. Foliola 3 lin. longa, rigidula, supra nitida. Petala demum libera.—Brazil, *Pohl;* Minas Geraes, *Claussen.*

5. P. *nitida,* (sp. n.), inermis, ramulis petiolisque puberulis demum glabratis, pinnis 8—10-jugis, foliolis multijugis linearibus vix falcatis, nitidis, nervo obscuro parum excentrico, spicis tomentellis, ovario longe stipitato villosissimo.—Omnino inermis videtur. Foliola numerosiora, minora, nitidiora quam in præcedente. Ovarium corollam sæpius superat.—Sandy woods about Rio Janeiro, *Pohl, Lello, Lhotsky.*

6. P. *filicicoma,* inermis, ramulis petiolisque tomentosis, pinnis 12—20-jugis, foliolis multijugis minimis linearibus, nervo marginali, spicis gracilibus tomentosis, floribus pubescentibus.—Foliola 1 lin. longa, nitida, margine ciliata, subtus puberula v. glabra. Spicæ tripollicares. Petala demum libera. Ovarium corollam superat.—*Acacia filicoma,* Mart. Herb. Bras., 109. Brazil, *Martius, Pohl, Langsdorff, Sello.*

7. P. *foliolosa* (sp. n.) ; inermis, ramulis incrassatis angulatis petiolisque ferrugineo-puberulis, pinnis 12—20-jugis, foliolis multijugis oblique oblongo-linearibus falcatis, nervo marginali, spicis gracilibus tomentosis paniculatis, floribus pubescentibus.—*P. filicicomæ* affinis. Ramuli multo crassiores. Foliola 2 lin. longa, proportione latiora. Flores minus tomentosi. Ovarii stipes brevior.—Amazon River, Pöeppig.

8. P. *psilostachya,* inermis, ramulis petiolisque puberulis, pinnis 7—10-jugis, foliolis multijugis oblongo-subovatis obtusis subfalcatis subbinerviis glabris nitidis, spicis gracilibus tomentellis.—Foliola 4 lin. longa, 1¼ lin. lata.—*Acacia psilostachya, DC. Prodr. v.* ii. *p.* 437.—Guiana, *Martin.*

9. P *ramosissima,* (sp. n.) ; ramulis petiolisque puberulis, aculeolatis, pinnis 3—5-jugis, foliolis 10—15-jugis oblongis obtusis subtus pubescentibus, nervo excentrico, spicis graci-

libus paniculatis, floribus glabriusculis.—Stipulæ breves latolanceolatæ. Foliola 3—4 lin. longa. Flores minimi.—Primitive forests in Brazil, *Martius.*

*** *Subtilifoliæ, foliolis linearibus, ovario stipitato glabro,*

10. P. *biuncifera* (sp. n.), ramulis foliisque pubescentibus, aculeis infra-stipularibus oppositis recurvis, pinnis 8—12-jugis, foliolis multijugis lineari-falcatis obtusis, spicis laxis paucis, corolla longa tenui.—Foliola 2—3 lin. longa. Spicæ tripollicares. Stamina longe exserta. Corolla 2½ lin. longa, petalis alte connatis. Legumen 8—9 pollicare v. longius.—Province of Piauhy, *Gardner, n.* 2558.

11. P. *subtilifolia.—Acacia subtilifolia,* Humb. et Kunth. Nov. Gen. et Sp. v. vi. p. 268.—From Kunth's description, this species appears to differ from the last by the leaflets being smooth on the upper surface, the spike of flowers shorter and more dense, and the pod oblong instead of linear.—Banks of the Chota in New Granada.

12. P. *viridiflora.—Acacia viridiflora,* Kunth. Mim. 81. t. 25.—Nov. Gen. et Sp. v. vi. p. 269.—Said by Kunth scarcely to differ from *P. subtilifolia.*—San Felix.

13. P. *trisperma*, glabriuscula, aculeis caulinis infrastipularibus paucis in petiolo sparsis, pinnis 3—5-jugis, foliolis 20—40-jugis linearibus supra nitidis, spicis axillaribus solitariis v. ad apices ramorum racemosis, floribus glabris, legumine oblongo-lineari. Foliola 3—4-lin. longa, uninervia et leviter reticulata, subtus minute puberula v. glabra. Spicæ vix bipollicares. Corolla vix lineam longa, petalis demum liberis. Legumen cum stipite 3—4-lineari fere 3 poll. longum, 6—8-lin. latum.—*Mimosa trisperma,* Vell. Fl. Flum. 11. t. 40. *Acacia trisperma,* Mart. Herb. Fl. Bras., 108.—Brazil, *Pohl, Martius, Sello, Vauthier, (n.* 83.*)*

14. P. *communis* (sp. n.), ramulis petiolisque puberulis sparse et raro aculeatis, inermibusque, pinnis 5—8-jugis, foliolis multijugis linearibus supra nitidis, spicis axillaribus ad apices ramorum racemosis, floribus glabris, legumine lineari.

—A. P. *trisperma* differt aculeis sparsis nec oppositis infrastipularibus, foliolis minoribus numerosioribus. Affinis etiam P. *macradeniæ* et pariter variat caule aculeato v. inermi, suberoso-alato v. vix angulato, facile distinguitur ovario glabro. Legumen 4—8-poll. longum, 8—10-lin. latum.—Brazil, *Pohl, Sello*; Rio Janeiro, *Guillemin*; near Barro do Jardin, *Gardner, (n.* 1943.) The latter specimen is a slight variety with smaller leaves, more crowded leaflets, and longer stipules.

15. P. *rigida* (sp. n.), inermis, glabra v. ramulis petiolisque vix minute puberulis, pinnis 4—6-jugis, foliolis multijugis lineari-falcatis acutis plurinerviis rigidis supra nitidis, spicis axillaribus subsolitariis, floribus glabriusculis, seminibus anguste alatis.—Foliola 4 lin. longa. Spicæ pollicares. Corolla 1 lin. longa, glabriuscula. Legumen stipitatum 5 poll. longum, 7—8-lin. latum, marginibus leviter incrassatis, valvulis rigide membranaceis. Semina ovata, plano-compressa, oblique transversa, ala membranacea.—Brazil, *Sello*.

16. P. *pterosperma* (sp. n.), inermis, ramis petiolisque pubescentibus, pinnis 4—5-jugis, foliolis 8—12-jugis oblongo-linearibus obtusis obliquis, nervo subcentrali, subtus puberulis, spicis axillaribus subsolitariis, seminibus lato-alatis. Legumen 5-pollicare, pollicem latum, valvulis ut in præcedente rigidulis. Semina plano-compressissima, ovato-subreniformia, nitida, cum ala 1½—2-lineari 9—10-lin. lata, 5—6-lin. longa.

**** PANICULATÆ, *foliolis latis, ovario subsessili glabro.*

17. P. *paniculata* (sp. n.), inermis, ramis petiolisque tomentellis demum glabratis, pinnis 2—3-jugis, foliolis 4—8-jugis ovali-oblongis v. lanceolato-ovatis obliquis subtus tomentellis, spicis gracilibus numerosis canescentibus.—Foliola 1—1½-pollicaria. Spicæ 2—3-pollicares, in paniculam amplam dispositæ. Petala apice dorso pubescentia. Legumen 6—7-poll. longum, fere 1½ poll. latum.—Rio Janeiro, *Langsdorff, Sello, Pohl.*

β? aculeis in caule parvis sparsis, legumine angustiore.—A single specimen without flowers, and only one pod, in Sello's collection.

The *Acacia aspidioides*, G. F. W. Mey. Prim. Fl. Esseq., 165, DC. Prod. ii. 458, is probably a *Piptadenia* belonging to the section *Eupiptadenia*.

Sect. II. Pityrocarpa. *Legumen inter semina plus minusve contractum, valvulis coriaceis siccitate glanduloso-leprosis sub-rufescentibus.*—Frutices? v. arbores parvæ, floribus spicatis.

18. P. *inæqualis* (sp. n.), inermis, glabra v. puberula, pinnis 1—3-jugis, foliolis 2—5-jugis valde inæqualibus oblique falcato-ovatis oblongisve nitidis glabris v. subtus vix puberulis, spicis axillaribus v. paucis folio brevioribus, ovario breviter stipitato.—Folia ultima tripollicaria, inferiora vix semipollicaria, interdum fere trapezoidea. Petala glabra. Ovarium minute glanduloso-pubescens. Legumen immaturum crassiusculum, glanduloso-leprosum, inter semina leviter contractum.—Rio Janeiro, *Langsdorff*, *Pohl*!

19. P. *leptostachya* (sp. n.), inermis, ramulis petiolisque ferrugineo-puberulis demum glabris, pinnis 3—4-jugis, foliolis 4—8-jugis oblique falcato-ovatis oblongisve nitidis glabris v. subtus vix puberulis, spicis axillaribus v. paucis gracilibus folio vix brevioribus, ovario breviter stipitato. P. *inæquali* affinis quidem, sed diversa videtur foliolis numerosioribus vix unquam pollicem longis. Legumen non vidi.—Brazil, *Sello*.

20. P. *moniliformis* (sp. n.), inermis, ramulis petiolisque tomentoso-pubescentibus, pinnis 2—4-jugis, foliolis 8—10-jugis oblique oblongis subtrapezoideis supra nitidis subtus canescenti-tomentosis, spicis axillaribus subsessilibus tomentellis, ovario longissime stipitato, legumine plano moniliformi.—Foliola majora semipollicaria v. parum longiora. Petala glabra. Stipes ovarii staminibus fere æquilonga. Legumen 3—5-pollicare, falcatum, inter semina valde contractum et forte intus subinterruptum, in speciminibus vix maturum.

Semina obovato-orbicularia plano compressa.—Common in the provinces of Bahia, *Blanchet*, 2701, and 2899, and Piauhy, *Gardner, n.* 2139. The *Acacia Thibaudiana*, DC. Prod. ii. 456, or *Sophora obliqua*, Pers. Syn. i. 452, is probably the same species.

Sect. III. Niopa. *Legumen inter semina sæpius plus minusve contractum valvulis membranaceo-coriaceis extus siccitate glanduloso-leprosis rufescentibus rarius læviusculis. Arbores inermes, pedunculis fasciculatis brevibus axillaribus, floribus globoso-capitatis. Legumina stipitata.*

In the distinction of the five following species I am not sure that I am right. The foliage and flowers are so much alike that one would be tempted to consider them all (except perhaps P. *microphylla*,) as varieties of one, were it not for the fruit which differs considerably in form and proportions. This makes me, in some cases, doubt whether I have properly matched the flowering and fruit-bearing specimens.

21. P. *peregrina*, pinnis 15—30-jugis, foliolis 30—80-jugis glabriusculis ciliolatis obscure uninerviis, pedunculis capitulo pluries longioribus, floribus puberulis, legumine recto-moniliformi, margine vix incrassato.—Glandulæ ut in omnibus fere *Piptadeniis* majusculæ prope basin petioli, minores infra juga pinnarum 2—3 suprema. Foliola 1½—2- lin. longa. Pedunculi plerique fere pollicares. Legumen 3—5-poll. longum, 5—6-lin. latum, inter semina valde contractum et facile (dum immaturum?) rumpens, maturum bivalve, valvulis fuscis in siccitate verrucoso-punctatis.—*Mimosa peregrina*, Linn. (*Acacia*, Willd., DC.) *Inga Niopa*, Humb. et Bonpl. in Willd. Sp. iv. 1025, (*Acacia*, Humb. et Kunth, Nov. Gen.) Mimosa? *Acacioides*, Benth. in Hook. Journ. Bot. ii. 132.—On the upper Essequibo and the Rio Branco; *Schomburgk;* on the Orinoco, and in New Granada, Humboldt and Bonpland; Peru, *Mathew's n.* 907; and perhaps Utinga in Brazil, *Blanchet*, 2761. Though I have not seen Humboldt's specimens either of the plant described by Kunth from flowering specimens, as *Acacia peregrina*, or of that described

by him in fruit, as *A. Niopa*, I feel convinced that they belong both to the tree which Schomburgk mentions as being common, and applied by the natives to the same uses as those stated by Humboldt.

22. P. *macrocarpa* (sp. n.), pinnis 10—25-jugis, foliolis 20—40-jugis glabriusculis ciliatis obscure uninerviis, pedunculis capitulo 2—3-plo longioribus, floribus puberulis, legumine subfalcato lævissime sinuato, marginibus incrassatis.—Foliola P. *peregrinæ*. Legumen semipedale et longius, pollicem latum, vix (nisi ubi semina hinc inde abortiva), inter semina contractum.—Brazil, *Pohl, Sello; Gardner, n.* 1584. No. 1107 of Martius, Herb. Pl. Bras. in either this or the preceding species.

23. P. *falcata* (sp. n.), pinnis 10—18-jugis, foliolis 40—60-jugis uninerviis nitidis glabris, capitulis multifloris glabris, legumine falcato crassiusculo leviter sinuato marginibus vix incrassatis.—Folia fere *P. nitidæ*. Foliola 2½—3-lin. longa, nervo subtus prominente. Capitula majora quam in præcedentibus. Legumen 2—3-poll. longum, 7—8-lin. latum, valde falcatum.—Brazil, *Sello,*

24. P. *colubrina*, pinnis 15—20-jugis, foliolis 50—80-jugis uninerviis nitidulis margine ciliatis glabris, legumine longe stipitato recto elongato inter semina contracto, marginibus incrassatis.—Foliola numerosiora, minus nitida quam in præcedente cui similia. Legumen 6—9-poll. longum, 7—8-lin. latum, demum fere læve.—*Mimosa colubrina*, Vell. Fl. Flum. 11. t. 16. *Acacia colubrina*, Mart. Herb. Fl. Bras.—Brazil, *Sello.*

25. P. *microphylla* (sp. n.), canescenti-tomentello, pinnis 20—30-jugis, foliolis 50—80-jugis minimis imbricatis obscure uninerviis, capitulis multifloris glabris.—Pinnæ etsi multifoliolatæ vix unquam pollice longiores. Foliola vix lineam longa. Glandula antherarum longe stipitata. Legumen non vidi.—Brazil, *Sello, Pohl.*

VII. STRYPHNODENDRON, *Mart.*

Flos *Entadæ*, sessilis. Legumen lineare, compressum, crasso-coriaceum, ad suturas bimarginatum, intus carnosum et incomplete septatum, maturitate valvulis subbaccantibus dehiscens. Semina transversa, funiculo filiformi appensa.—Arbores sæpius parvæ, ramulis crassis. Folia bipinnata multifoliolata, foliolis sæpius latiusculis basi subtus ad axillas nervi medii barbata. Glandulæ ut in *Piptadenia* majuscula prope basin petioli, minores inter v. infra foliola suprema et interdum inter v. infra pinnas supremas. Flores parvi, spicati, spicis axillaribus breviter pedunculatis.

1. S. *Barbatimam* (Mart. Herb. Fl. Bras. 117.), ramulis crassissimis junioribus rufo-tomentellis demum petiolisque glabris, pinnis 5—8-jugis, foliolis 6—8-jugis oblique ovato-orbiculatis concoloribus subtus barbatis cæterum glabris, legumine oblongo-lineari recto.—Folia fere pedalia siccitate nigricantia. Foliola adulta pollicem longa, 3—4-poll. lata, obtusissima v. retusa. Spicæ 2—4-pollicares. Corolla 1½-lin. longa, petalis sæpius ad medium connatis. Legumen fere 3 poll. longum, semipollice latius. Semina 12—15, oblonga.—Brazil, *Pohl, Sello.*—*Mimosa Barbadetimam,* Vell. Fl. Flum. 11. t. 7.

2. S. *rotundifolium* (Mart. l. c.), pinnis multijugis, foliolis multijugis glabris orbicularibus.—Oeiras, Prov. Piauhy, *Martius.*—This species is unknown to me.

3. S. *discolor* (sp. n.), subglabra, pinnis 5—6-jugis, foliolis 7—8-jugis oblique orbiculatis subtus candidis, spicis folio dimidio brevioribus.—Foliola pleraque semipollicaria, subtus fere nitentia et basi breviter barbata. Spicæ tenuiores quam in S. *barbatimam.*—Serra de Araripe, near Caldas, Prov. Piauhy, *Gardner, n.* 1945. This may be the S. *rotundifolium,* Mart., but scarcely agrees with his very short character.

4. S. *polyphyllum* (Mart. l. c.), ramulis crassis petiolisque pulveraceo-tomentellis, pinnis 15—20-jugis, foliolis 10—20-jugis oblique oblongo-ellipticis subtus discoloribus pubentibus, corolla glaberrima, legumine oblongo-lineari recto v. leviter falcato.—Folia pedalia. Foliola 3 v. rarius 4 lin. longa, 2 lin. lata, obtusa. Spicæ et flores ut in *S. barbatimam.* Legumen longius et sæpius falcatum, cæterum

simile. Flores, teste Gardnero, punicei, an in omni genere?—Brazil, from the Organ Mountains, *Gardner, n.* 364, to the Rio Negro, *Langsdorff*, also in Sello's and other collections.

5. S. *floribundum* (sp. n.), ramulis angulatis junioribus petiolisque tomentellis, pinnis 12—15-jugis, foliolis 10—20-jugis oblique oblongis subtus pallidioribus puberulis, corolla adpresse pubescente.—Affine *S. polyphyllo.* Foliola et flores minora.—Bahia; *Salzmann, Blanchet, n.* 397. Pernambuco; *Gardner, n.* 986.

VIII. ADENANTHERA. *Linn.*

Flos pedicellatus. Calyx brevis, 5-dentatus. Petala lanceolata, demum libera. Stamina 10. Antheræ glandula substipitata decidua superatæ. Legumen lineare, falcatum, compressum, uniloculare, valvis membranaceo-coriaceis dehiscens. Semina lata, compresso-convexa (pulpa tenui nidulantia?), funiculo brevi strophiolati affixa.—Arbores Asiæ tropicæ, inermes. Folia bipinnata, pinnis foliisque pluri-v. multijugis. Racemi subspicæformes, axillares v. ad apices ramorum pauci, racemosi. Flores albi v. flavescentes.

The flowers of this genus are nearly the same as in *Entada* and *Prosopis*, but constantly pedicellate, and rather larger than in *Entada*. The fruit is not very different from that of *Piptadenia*, but the thick seeds with a short funicle are not to be found in any of the four preceding genera, and the pedicellate flowers give it at once a distinct habit.

1. A. *pavonina* (Linn. Spec. 550), subglabra, pinnis 2—5-jugis, foliolis 6—10-jugis alternis distantibus ovatis v. ovato-oblongis, staminibus vix corolla longioribus.—East India, and thence introduced into the West Indies and various parts of S. America.

2. A. *chrysostachys*, ramulis petiolis rhachibusque pubescentibus, pinnis 3—6-jugis, foliolis 8—15-jugis oppositis oblique oblongis subtus pallidis pilosulis, staminibus corolla dimidio longioribus.—*Mimosa chrysostachys*, Hels. et Boj. Mss.—*Acacia chrysostachys*, Sweet.—Foliola 4—6 lin. lon-

ga, vix 1½ lin. lata. Spicæ tripollicares. Flores paullo minores quam in *A. pavonina*. Legumen non vidi.—Madagascar; *Bojer*.

3. A. *falcata* (Linn. l. c.), Moluccas.—Only known from Rumphius' figure and description (*Herb. Amb.* iii. 176. *t.* 111), but is probably a true *Adenanthera*.

A. *Bonplandiana*, Humb. et Kunth. Nov. Gen. v. vi. p. 311, cannot well belong to this genus, nor yet, it would appear, to *Prosopis*; probably it may be referrible to some one of those above described, but as I have not seen the specimens, and the fruit is entirely unknown, I cannot venture to place it anywhere.

IX. ELEPHANTORRHIZA. *Gen. Nov.*

Flos breviter pedicellatus *Adenantheræ*. Legumen "rectiusculum, compressum, suturis constanter clausis, valvulis autem ut in siliqua demum a suturis incrassatis secedentibus, perfecte uniloculare, pulpa refertum, ut colligo ex substantia nigricante valvulas interne obducente, exsiccata quidem, sed in aqua fervida solubile." (*E. Meyer*).—Suffrutex glaber, inermis, radice lignoso-tuberosa, caulibus herbaceis, 1—2-pedalibus. Folia bipinnata, pinnis foliolisque multijugis, petiolis eglandulosis, florum racemis spiciformibus. —Spec. unica. *E. Burchellii*—*Acacia elephantorrhiza*, Burch. in DC. Prodr. v. ii. p. 457.—*Prosopis elephantorrhiza*, Spreng. Syst. Cur. Post. 165.—Caffer-country in extratropical S. Africa.—This plant was placed by De Candolle in *Acacia*, with a query whether it was not rather a species of *Prosopis*. E. Meyer, who describes the pod from Drege's specimens, says, "Legumen singulum vidi, vetustate corruptum, de genere tamen omne dubium removens," and consequently retains it without doubt in *Prosopis*. With this I cannot agree; as not only do the more pedicellate flowers, habit and foliage, remove it in appearance from *Prosopis*, but the pod above described does not at all agree with that of *Prosopis*, which is multilocular, indehiscent, and does not separate from the sutures. The *Elephantorrhiza*

is nearer in character to *Adenanthera*, but the habit and the pod appear to me sufficient to warrant its being considered as a distinct genus. I have only seen it in flower.

X. TETRAPLEURA. *Gen. Nov.*

Flos pedicellatus *Adenantheræ*. Legumen "obtusum compressum, margine aculeum, lignosum; loculis transversis remotis monospermis; medio per totam longitudinem utrinque latere auctum crista subcarnoso-dura pericarpio conformi eoque fere crassiore, margine obtusa, quo pericarpium quadrialatum primo adspectu mentitur. Semina ovata, compressa, alteri suturæ affixa, magnitudine seminis Tamarindi." (*Thonning.*)—Arbor alta. Folia opposita, bipinnata, pinnis foliolisque multijugis, floribus spicatis.—Species unica. *P. Thonningii.*—*Adenanthera tetraptera*, Schum. Beskr. Pl. Guin. 213.—Near Aquapim in tropical Africa.

The above character is taken entirely from Thonning's description in Schumacher's work above quoted. I have not seen the plant, but Sir W. J. Hooker has received a pod from tropical Africa, answering to the above description. It is transversely multilocular, like those of *Stryphnodendron*, *Gagnebina*, and *Prosopis;* but the four woody thick wings, or rather ribs, give it so peculiar a form as not to admit of its being united with either of those genera, unless the whole be considered as forming but one.

XI. GAGNEBINA. *Neck.*

Flos *Entadæ*, sessilis. Legumen oblongo-lineare, compressum, indehiscens, margine ex utraque sutura membranaceo-alatum, intus transverse multiloculare, epulposum. Semina transversa, funiculo filiformi appensa.—Arbor inermis. Folia bipinnata, pinnis foliolisque (parvis) multijugis. Flores parvi spicati.—Species unica, *G. tamariscina*, DC. Prodr. v. ii. p. 438. (*Mimosa tamariscina*, Lam.); a qua non differt, *G. axillaris*, DC. l. c. (*M. pterocarpa*, Lam.)—Mauritius. *Boutan, Bojer, Sieber, Telfair, Néraud, &c.*

Lamarck appears to have described his *M. tamariscina*, and *M. pterocarpa*, from two specimens of the same species, the one in flower, the other in fruit. It is true, he says, that the wing of the pod in his *M. pterocarpa*, is "situé seulement le long de son bord supérieur," but Vahl, who appears to have seen Lamarck's plant, makes use of the expression, "membrana longitudinaliter *cinctum*." The distinctive characters of the two supposed species, given by De Candolle, are too variable in one and the same specimen to be made available.

XII. PROSOPIS. *Linn.*

Flos fere *Entadæ*, sessilis v. brevissime pedicellatus. Antheræ (exceptis *P. denudante et humili*), ut in præcedentibus glandula superatæ. Legumen lineare, compressum v. subteres, rectum falcatum v. varie contortum, indehiscens, transverse multiloculare et inter semina sæpe solubile, endocarpio maturitate spongioso-subcarnoso farinaceo v. pulposo. Semina funiculo filiformi appensa nuda v. pulpa tenuia circumdata. —Arbores v. frutices, aculeati inermes v. spinis axillaribus (pedunculis ramulisve abortivis?) solitariis binisve stipularibusve binis armati. Folia bipinnata sæpius rigida. Pinnæ 1—2-jugæ rarius 3—5-jugæ. Foliola plura v. multijuga. Glandulæ inter pinnas parvæ v. obscuræ, inter foliola sæpius minimæ, vix conspicuæ, rarius autem in petiolo communi v. partiali omnino deficientes. Spicæ cylindricæ, v. globosæ, axillares.

The gland of the anthers was formerly supposed to exist in the *P. spicigera* alone, and the American species were separated by De Candolle into a distinct section chiefly on this account. When examining Hartweg's Mexican plants some years since, I observed that all the American species had their petals woolly within side of their apex, and the pod appeared to me much flatter than in the E. Indian species, and I proposed raising De Candolle's section *Algarobia* to the rank of a genus. Since then, however, I have ascertained that the stipitate gland exists in all the American species excepting two, and that the pod, though perfectly flat in many species before it is quite ripe, even after the seeds have attained their full size, often swells out at the last so as to become nearly as thick as in *P. spicigera;* and in some dwarf species which can scarcely be generically distinguished, it is quite cylindrical.

Sect. I. ADENOPIS, *DC. Petala intus glabra. Ovarium glabrum. Legumen teres v. incrassato-difforme.—Species Asiaticæ, aculeis sparsis armatæ, rarius inermes.*

1. P. *spicigera* (Linn. Mant. 68.), arborea v. frutescens, glabra, aculeis sparsis rarius nullis, pinnis 1—2-jugis, foliolis 6—12-jugis oblongis v. lato-linearibus, spicis elongatis subinterruptis solitariis geminisve, legumine elongato subtereti toruloso.—*Adenanthera aculeata,* Roxb. Fl. Ind. v. ii. p. 371.—Common in E. India.—Some specimens from hot dry situations in S. Persia (*Aucher-Eloy. n.* 4370), have sharper leaflets, stronger prickles, and rather larger flowers.

2. P. *Stephaniana* (Kunth), frutescens, aculeis sparsis, ramulis petiolisque pubescentibus, pinnis 2—5-jugis, foliolis 8—12-jugis oblongis subtus puberulis, spicis laxiusculis folio longioribus, legumine ovoideo-oblongo crasso subincurvo v. difformi.—*Lagonychium Stephanianum, Bieb.—DC. Prodr.* v. ii. *p.* 448. *cum. syn.—Mimosa agrestis, Sieb.! in Spr. Syst. v.* ii. *p.* 206.—Common in North Persia and Syria. *Aucher Eloy. n.* 963, 4369, 4370. *Steven, Sieber, Booé, &c.*

This plant has precisely the flowers of *P. spicigera,* and the pod only differs in its short and thick proportions and closer seeds: it is not contracted between them unless where several seeds are abortive.

Sect.? II. ANONYCHIUM. *Petala intus glabra. Ovarium villosum.*—Species Africanæ inermes, habitu Algarobiis affines. Legumen non satis notum, et ideo de genere dubitandum est.

3. P.? *lanceolata* (sp. n.); ramulis petiolisque minute tomentellis, pinnis 1—2-jugis, foliolis 4—8-jugis, distantibus oblongo-lanceolatis crassiusculis glabris, spicis cylindricis densis breviter pedunculatis.—Folia rigida et glandulæ par-

væ *Algarobiarum.* Foliola 8—10 lin. longa, rarius pollicaria. —Æthiopia, *Kotschy, n.* 381.

4. P.? *oblonga* (sp. n.), ramulis petiolisque minute tomentellis, pinnis plerisque 2-jugis, foliolis 6—10-jugis subdistantibus elliptico-oblongis membranaceis supra glabris subtus minute pubescentibus, spicis cylindricis breviter pedunculatis.—Habitu *P. lanceolatæ* affinis. Foliola 7—9 lin. longa. Spicæ sesquipollicares. Flores in utraque specie omnino *Algarobiarum* exceptis petalis intus glabris. Legumen crassum dicitur et oblongum, ipse non vidi.—Gombo country and Cayor in tropical Africa. *Heudelot, n.* 14.

Sect. III. ALGAROBIA, *DC. Petala apice intus lanata. Ovarium villosum. Legumen elongatum, sæpius falcatum, planum, convexum, v. demum subteres.*—Species Americanæ, spinis axillaribus solitariis geminisve armatæ v. inermes.

* ELATÆ. *Arbores v. frutices pluripedales foliatæ. Glandula antherarum distincta.*

The species of this section, all of them furnishing the sweetish succulent pod called *Algarobo*, and more or less eatable (for horses or Indians), are very variable, and all (excepting perhaps the *P. Limensis,*) run so much one into the other, that they might possibly be mere varieties of one species. My materials do not however admit of my forming any decided opinion, as there are several of the described forms which I have not seen.

5. P. *glandulosa* (Torr.! in Ann. Lyc. N. York, v. ii. p. 192. t. 2.), ramulis foliisque glabris, spinis axillaribus solitariis geminisve validis rectis, pinnis 1-rarius 2-jugis, foliolis 6—15-jugis distantibus oblongo-linearibus subfalcatis subcoriaceis, spicis elongatis breviter pedunculatis, legumine crassiusculo.—Foliola pleraque 6—8 lin. longa, 1—1½ lin. lata, nonnulla interdum lata fere obovata.—*Algarobia glandulosa,* Torr. et Gr. Fl. N. Amer. v. i. p. 399.—Canadian river, *Dr James;* Texas, *Drummond,* 2d coll. n. 86; 3d. coll. n. 160; *Berlandier, n.* 1445, 1588.

6. P. *juliflora* (DC. Prodr. v. ii. p. 447), from Jamaica,

appears to be very near *P. glandulosa*, but with more numerous leaflets. I have not seen it. In continental botanic gardens, the *P. dulcis*, and *P. siliquastrum*, are to be met with under the name of *P. juliflora.*

7. P. *siliquastrum* (DC. Prodr. v. ii. p. 447), ramulis foliisque glabris v. vix junioribus minute puberulis, spinis axillaribus solitariis geminisve validis rectis, pinnis 1-rarius 2-jugis, foliolis 12—20-jugis distantibus elongato-linearibus subfalcatis obtusis subcoriaceis, spicis elongatis densis breviter pedunculatis, legumine compressissimo arcuato.—Foliola pleraque 9—12 lin. longa, vix unquam lineam lata.—Andes of Chili, from San Jago to the Rio Colorado, *Poeppig; Gillies; Cuming, n.* 257; *Lord Colchester; Bridges, n.* 516, *&c.*

P. *flexuosa* (DC. Prodr. v. ii. p. 447), is probably the same species with a rather more fleshy pod.

8. P. *horrida* (Humb. et Kunth, Nov. Gen. et Sp. vi. 306), ramulis glabris, spinis geminis validis longis rectis, pinnis 2—3-jugis, foliolis 10—12-jugis oblongis utrinque pubescentibus, spicis densis breviter pedunculatis folio subbrevioribus. —Andes of Peru; *Humboldt and Bonpland.*—Unknown to me.

9. P. *fruticosa* (Meyen.! Reise. v. i. p. 376); ramulis foliisque minute puberulis v. demum glabratis, spinis axillaribus solitariis geminisve validis rectis, pinnis 1-rarius 2-jugis, foliolis 12—20-jugis distantibus breviter linearibus obtusis subcoriaceis, spicis densis breviter pedunculatis folio brevioribus v. vix longioribus, legumine compressissimo arcuato (v. demum incrassato?)—Foliola dimidio minora et minus distantia quam in *P. siliquastro.*—*P. flexuosa*, Hook. et Arn.! Bot. Misc. iii. 203. vix. DC.—Probably a variety of *P. siliquastrum*, of a dwarf stature, being but a shrub or small tree, and with shorter leaflets usually downy.—Andes of Chili, *Gillies, Meyer*, and others.

10. P. *dulcis*, (Kunth, Mim. 110. t. 34.); ramulis foliisque glabris, spinis axillaribus solitariis geminisve validis rectis, pinnis 1—2-jugis foliolis 18—30-jugis, approximatis lineari-

bus obtusis brevibus, spicis densis breviter pedunculatis folia superantibus, legumine compresso nunc compressissimo arcuato.—Spinæ sæpius minores quam in præcedentibus, interdum omnino desunt. Foliola 2—3 lin. longa, rarius longiora,—Algarobia dulcis, *Benth. Pl. Hartweg.* 13. P. pallida, *Kunth. Mim.* 106.—Common in Mexico.

β. domingensis, foliolis majoribus submembranaceis.—*P. domingensis*, DC. ! Prodr. v. ii. p. 447.—*P. bracteolata*, DC. l. c.?—P. *cumanensis*, Kunth. Mim. 106 ?—St Domingo, and Isle of St Martha, *Bertero ;* Cumana, *Humboldt and Bonpland ;* Guayaquil, *Hall ;* Carthagena, *Billberg*.—Probably a cultivated form.

γ. australis ; foliolis minoribus legumine latiore crassiore. —*P. affinis*, Spreng. Syst. v. ii. p. 326.—South Brazil, Monte Video, and Buenos Ayres, *Sello, Tweedie, Gillies*, and others.

To the above varieties should probably be added the five preceding species, most of them known under the name of *Algarobo*, very common along the chain of the Andes from Buenos Ayres and Mendoza to Mexico, and offering generally "a great many varieties."

11. P. *inermis* (Humb. et Kunth, Nov. Gen. et Sp. v. vi. p. 307.), inermis, ramulis glabris, pinnis 3-jugis, foliolis 6—13-jugis lineari-oblongis subtus tenuissime puberulis.—Peru, *Humboldt and Bonpland*.—Probably a thornless form of *P. dulcis, β*.

12. P. *limensis* (sp. n.), ramulis foliisque pubescentibus, spinis axillaribus solitariis geminisve validis rectis, pinnis 2—3-jugis, rarius unijugis, foliolis 6—12-jugis approximatis parvis oblongis obtusis, spicis densis folio multo longioribus, legumine brevi crasso subtereti.—Foliola 1½—2½ lin. longa, utrinque puberula. Spicæ sæpe 4-pollicares. Flores *P. dulcis*, calyces tamen proportione corollæ breviores. Legumen unicum vidi rectum 2½ poll. longum, 5 lin. latum, minus compressum quam in cæteris hujus sectionis.—Lima, *Mathews, Cuming, n.* 974.—This appears to me to be really distinct from any of the preceding.

** HUMILES. *Fruticuli humiles, foliis parvis paucis v. nullis. Glandula antherarum minuta fugacissima v. nulla.*

13. P. *denudans* (sp. n.), ramulis brevibus flexuosis foliisque puberulis, spinis axillaribus solitariis validis rectis, pinnis unijugis, foliolis 2—3-jugis parvis oblongo-linearibus, spicis oblongis pedunculatis, antheris eglandulosis, legumine compresso contorto-arcuato.—Spinæ, folia fasciculata, glandulæ petiolorum, petala intus lanata, antheræ ovatæ, legumina, omnia *Algarobiarum* præcedentium. Rami crassi breves. Foliola 1—1½ lin. longa.—Port Desire in Patagonia; *Middleton.*—Although I have been able to discover no gland on the anther of this species, scarcely any on those of *P. humilis*, and but a very small and fugacious one on *P. sericantha*, yet all the other characters are so much that of *Prosopis*, that I cannot but consider them as congeners.

14. P. *humilis* (Gill.! in Hook. Bot. Misc. iii. 204.), ramulis striatis glabris, spinis axillaribus solitariis geminisve elongatis striatis, foliis abortivis v. ad petiolum parvum glanduliferum 1—2-foliolatum reductis, spicis cylindricis pedunculatis glabris, antheris obscure glanduliferis v. nudis, legumine compresso falcato.—Pampas of Buenos Ayres, *Gillies.* San Jago and Patagonia, *Tweedie.*

15. P. *sericantha* (Gill.! l. c.), ramulis teretibus spinescentibus leviter puberulis aphyllis, spicis cylindricis subsessilibus pubescenti-incanis, glandula antherarum parva stipitata, legumine compresso rectiusculo.—Prov. San Luis, *Gillies.*

Sect. IV. STROMBOCARPA. *Petala apice intus lanata. Ovarium villosum. Legumen crassum v. subteres cochleato-contortum sæpius spirale.* Fruticuli Americani, stipulis spinescentibus armati, spicis oblongis v. sæpius globosis.

16. P. *torquata* (DC. Prod. ii. 448.), ramulis foliisque minute viscido-puberulis glabrisve, stipulis spinescentibus subulatis, foliorum petiolo brevissimo, pinnis 1-jugis (rarius bijugis?) foliolis 15—25-jugis parvis linearibus obtusis, spicis folio longioribus, legumine subcompresso moniliformi irregulariter subspiraliter contorto.—Prov. San Luis, *Gillies.*

17. P. *abbreviata* (sp. n.), ramulis foliisque minute viscido-puberulis glabratisve, stipulis spinescentibus subulatis, foliorum petiolo brevissimo, pinnis unijugis, foliolis 10—15-jugis minimis approximatis oblongis obtusissimis, spicis ovatis globosisve, pedunculo folium æquante, calyce corolla vix dimidio breviore, staminibus corolla duplo longioribus, legumine dense spiraliter contorto.— San Jago, *Tweedie.*

18. P. *reptans* (sp. n.), ramulis foliisque minute viscido-puberulis glabratisve, stipulis spinescentibus subulatis, foliorum petiolo brevissimo, pinnis unijugis, foliolis 6—10-jugis minimis approximatis oblongis obtusissimis, spicis globosis, pedunculo folio longiore, corolla calyce plus duplo longiore, staminibus breviter exsertis, legumine dense spiraliter contorto.—S. America, *Tweedie,* with the label " Mortworta of Cordova, used as a cure in Dysentery," and apparently the same species in Berlandier's Texas collection, n. 2013.

19. P. *strombulifera,* glaberrima, stipulis spinescentibus subulatis, foliorum petiolo brevi, pinnis unijugis, foliolis 4—6-jugis oblongo-linearibus obtusissimis subdistantibus, spicis globosis, pedunculis folio longioribus, corolla calyce duplo longiore, staminibus breviter exsertis, legumine dense spiraliter contorto.—*Acacia strombulifera,* Willd. Spec. iv. 1055. —Mendoza, *Gillies.*

P. *microphylla,* Humb. et Kunth, may perhaps be a species of *Acacia.* P. *dubia* of the same authors, described from a single leaf with Humboldt's notes on the pod, may be a *Pithecolobium.* P. *dubia,* Guillem. et Perrot, described also from leaves and pod only, appears to me more likely to be an *Acacia* than a *Prosopis.* P. *globosa,* and P. *ephedroides* of Gillies, belong to *Mimosa,* Sect. *Ameria.*

XIII. DICHROSTACHYS, *DC. Wight et Arn.*—Caillea, *Guillem.*—Desmanthi, Sect. *DC. Prodr.*

Flores in spica biformes, superiores hermaphroditi sessiles *Entadæ,* inferiores neutri calyce corollaque ut in hermaphroditis, filamentis 10 longis filiformibus antheris, ovarii rudimento parvo. Legumen lineare, contortum, compressum, membranaceo-coriaceum v. subcarnosum, intus uniloculare, epulposum, indehiscens v. valvulis a suturis irregulariter secedentibus. Semina plurima, obovata, compressa.—Frutices Africani v. Asiatici, ramulis hinc inde abbreviatis v. abortivis spinescentibus, cæterum inermes. Ramuli floriferi ad axillas brevissimi, fasciculato-foliiferi, stipulis imbricatis obtecti. Spicæ pedunculatæ, nutantes, solitariæ v. geminæ. Flores sessiles, hermaphroditi flavi, steriles albidi v. purpurascentes.

1. D. *tenuifolia* (sp. n.), ramulis petiolisque pubescentibus, pinnis subdistantibus 5—6-jugis, foliolis 15—25-jugis anguste linearibus ciliatis, glandula unica subsessili sub pinnarum jugo infimo, spicis folio brevioribus apice subglobosis densis, inferne interruptis paucifloris.—*Mimosa bicolor*, Hels. et Boj.—Madagascar, *Helsing* and *Bojer*.

2. D. *cinerea* (Wight et Arn.! Fl. Penins. Ind. Or. i. 271, cum syn.), ramulis petiolis pedunculisque pubescentibus, pinnis approximatis 8—10-jugis, foliolis 12—20-jugis ciliatis, glandulis inter pinnas stipitatis, spicis folia superantibus.—E. Indian Peninsula.

3. D. *nutans*, ramulis petiolis pedunculisque puberulis glabratisve, pinnis subdistantibus 8—12-jugis, foliolis 20—30-jugis ciliatis glabrisve, glandulis inter pinnas stipitatis, spicis vix folia superantibus.—Senegambia, *Hendelot*, *Brunner*, *Sieber*; Æthiopia, *Kotschy*, *n.* 216, Port Natal, *Krauss*, *n.* 148, and 326.—Caillea *dichrostachys*, Guillem. et Perrot. Fl. Seneg. i. 240.—To the *Desmanthus nutans*, *divergens*, *trichostachys* and *leptostachys*, already reduced to this species, may be added *Mimosa bicolor*, Schum. Pl. Guin. 326.

4. D. *Forbesii* (sp. n.), glabriuscula, pinnis 3—4-jugis, foliolis 10—15-jugis, glandulis inter pinnas stipitatis, spicis gracilibus folio vix longioribus.—Delagoa Bay, *Forbes*.—Near some forms of D. *nutans*, but the leaves are much smaller with few leaflets, and the spike nearly that of D. *cinerea*.

D. *caffra* (Meissn. in Pl. Krauss. exsicc. n. 166.), is not in my set of Krauss's plants, nor is it, as far as I am aware of, as yet published. I am also unacquainted with *Desmanthus callistachys*, DC.

XIV. NEPTUNIA, *Lour.*—Desmanthi Sect., *DC.*

Flores superiores, v. rarius omnes hermaphroditi, sessiles. Calyx campanulatus. Petala 5, ad medium cohærentia v. rarius libera. Stamina 10, rarius 5, libera, exserta. Antheræ ovatæ, glandula stipitata superatæ. Flores inferiores nunc neutri filamentis filiformibus anantheris, nunc masculi. Legumen oblongum, a stipite deflexum, planum, continuum, valvulis 2 membranaceis dehiscens, intus inter semina incomplete septatum, epulposum. Semina transversa, funiculo filiformi appensa. Herbæ suffruticesve inermes, prostratæ v. natantes. Folia bipinnata, foliolis parvis. Glandula inter v. infra pinnas jugi infimi v. sæpius nulla. Stipulæ membranaceæ, oblique cordatæ, acuminatæ. Pedunculi axillares, solitarii, bracteis 1—2 stipulæformibus deciduis onusti. Capitulum ad apicem pedunculi ovato-globosum.

This genus differs in habit from all the preceding ones, though the characters derived from its flowers and fruit come very near to those of *Piptadenia*. The habit is nearly that of some *Desmanthi* and *Mimosæ* (of the section *Ameria*); but the glanduliferous anthers and the pod are different from both. The antherous petaloid filaments in the lower flowers, the character by which *Dichrostachys*, *Neptunia* and *Desmanthus* have been associated together, and distinguished from all others, is constant only in the first two of the following species. In the remaining species, flowers of this description are frequently to be found in some heads and not in others of the same specimen.

1. N. *oleracea* (Lour. Fl. Cochinch. 654), natans, radicans, glabra, ramis teretibus, pinnis 2—3-jugis, petiolo eglanduloso, foliolis 8—20-jugis, capitulis ovoideis, floribus neutris numerosis, staminibus 10, legumine longe stipitato 6—

8-spermo.—*Desmanthus natans*, Willd., D. *lacustris*, Willd., et D. *stolonifer*, DC. cum syn. in Prod. ii. 444.—N. *stolonifera*, Guillem. et Perrot. Fl. Seneg. i. 239.—In stagnant waters in tropical America, Africa, and Asia, (*Wallich, Cat. n.* 5295. *Cuming*, Malacca, n. 2352.)

2. N. *plena*, prostrata v. ascendens, glabra v. hinc inde minute puberula, ramis compressis triquetrisve, pinnis 3—5-jugis, glandula inter pinnas infimas, foliolis 12—40-jugis, capitulis ovoideis, floribus neutris numerosis, staminibus 10, legumine breviter stipitato 5—20-spermo.—*Desmanthus plenus*, Willd., D. *punctatus*, Willd., et D. *polyphyllus*, DC. cum syn. in Prod. ii. 444, 445.—*Neptunia polyphylla*, Benth. in Hook. Journ. Bot. ii., 129.—*Mimosa adenanthera*, Roxb.! Fl. Ind. ii. 554.—Common in tropical America, cultivated in E. India.—Guiana, *Parker, Schomburgk, n.* 751; Tehuantepec, *Andrieux, n.* 407; Antigua, *Nicholson;* Serra Jacobina, near Bahia, *Blanchet, n.* 2700. (*Wallich, Cat. n.* 5298.)

3. N. *tenuis* (sp. n.), glabriuscula, diffusa, v. natans, ramis tenuibus triquetris compressisve, pinnis 2—4-jugis, foliolis, 10—15-jugis, capitulis ovoideis oblongisve, floribus omnibus antheriferis inferioribus masculis, staminibus 10, legumine longe stipitato.—*Desmanthus lacustris* Torr. et Gr. Fl. N. Am. i. 402, non alior.—Texas, *Drummond*, 3d coll. n. 150.

4. N. *triquetra*, glabriuscula, diffusa, ramis gracilibus triquetris compressisve, pinnis 2—3-jugis, petiolo glanduloso v. obscure uniglandulifero, foliolis 6—12-jugis, capitulis globosis, floribus anantheris paucis parvis v. nullis, staminibus 10, legumine breviter stipitato 4—8-spermo.—*Desmanthus triquetrus*, Willd. DC. Prodr. ii. 444.—Brazil, *Sello* E. Indian Peninsula, *Heyne, Wight, Jaquemont, Shuter, etc.*, (*Wallich, Cat. n.* 5296.)

5. N. *gracilis* (sp. n.), glabriuscula, diffusa, ramis gracilibus triquetris compressis, foliis eglandulosis, pinnis 1—2-jugis, foliolis 6—20-jugis, capitulis parvis globosis, flori-

bus omnibus plerisve antheriferis, staminibus 5, legumine breviter stipitato 3—8-spermo. Habitus N. *triquetræ.*—Australia, *Bäuer*, *Mitchell.*

Desmanthus acinaciformis, Spanoghe in Linnæa xv. 198, and D. *trispermus*, Spanoghe, l. c., both of them from Timor, and unknown to me, are probably near to N. *gracilis.*

6. N. *lutea*, pubescens, prostrata, ramis elongatis triquetris compressisve, foliis eglandulosis, pinnis 3—5-jugis, foliolis 15—20-jugis densis linearibus ciliatis, capitulis ovoideis multifloris, floribus plerisque hermaphroditis omnibus antheriferis, staminibus 10, legumine longiuscule stipitato 4—6-spermo.—*Acacia lutea*, Leavenw.—Torr. et Gr.! Fl. N. Amer. 1. 403.—Arkansas, Texas, *Drummond*, 3d coll. n. 158.

7. N. *pubescens* (sp. n.), prostrata, pubescens, ramis elongatis, pinnis 2—3-jugis foliis eglandulosis v. inter pinnas infimas obscure uniglandulosis, foliolis 20—30-jugis densis linearibus ciliatis, capitulis ovato-globosis parvis, floribus omnibus antheriferis, staminibus 10, legumine breviter stipitato 4—6-spermo.—Lima, *Cuming, n.* 1027.—Very near N. *lutea.* The stipules are larger, the flower heads much smaller, and the stalk of the pod scarcely more than a line long.

Subtribe II. GYMNANTHERÆ.

Antheræ apice non glanduliferæ.

XV. DESMANTHUS. *Desmanthi* Sect. et *Darlingtonia*, DC.

Flores superiores nunc omnes hermaphroditi, inferiores pauci masculi v. anantheri steriles. Calyx campanulatus 5-dentatus. Petala 5, libera v. medio leviter cohærentia. Stamina 10, v. 5. Legumen lineare, rectum v. falcatum, planum, continuum, valvulis 2 membranaceis dehiscens, intus epulposum, uniloculare v. inter semina incomplete septatum. Semina longitudinalia v. obliqua, funiculo filiformi appensa. Herbæ suffruticesve inermes ramis herbaceis plus minusve angulato-striatis. Folia bipinnata, sensitiva, foliolis parvis. Glandula unica infra pinnas infimas, rarius nulla v. plures infra pinnas omnes. Stipulæ setaceæ. Pedunculi axillares, solitarii ebracteati. Capitulum ovato-globosum.

1. D. *leptolobus* (Torr et Gr.! Fl. N. Amer. i. 402.), glabriusculus, caule angulato, pinnis 6—10-jugis, foliolis 15—25-jugis anguste linearibus, glandula parva infra pinnas 1—2-infimas, capitulis paucifloris, floribus pentandris, leguminibus angustis 5—8-spermis, seminibus anguste oblongis. —Arkansas, Texas, *Drummond*, 3d coll. n. 152.

2. D. *virgatus* (Willd. Spec. iv. 1047.), erectus, glabriusculus, caule angulato, pinnis 1—7-jugis distantibus, foliolis 10—20-jugis oblongo-linearibus, glandula ovata majuscula infra pinnas infimas, capitulis paucifloris, floribus decandris, leguminibus 10—30-spermis, seminibus ovatis.—D. *virgatus*, Willd.; D. *strictus*, Bertol.; and D. *leptophyllus*, Humb. et Kunth.—DC. Prod. ii. 444, 445, cum syn.—Common in the West Indian islands, also Pernambuco, *Gardner*, *n.* 981, S. Brazil, and Buenos Ayres, *Tweedie*, *Gillies*, *etc;* East India, *Jaquemont*, *Wallich*, (Cat. n. 5297.) *etc.*

3. D. *depressus* (Kunth. Mim. 115. t. 35.), diffusus, glabriusculus, pinnis 1—5-jugis, foliolis 10—20-jugis, glandula orbiculata sæpius parva nunc deficiente infra pinnas infimas, capitulis paucifloris, floribus decandris, leguminibus 8—30-spermis rectiusculis v. leviter falcatis, seminibus ovatis.—Common in the West Indian islands, also Texas, *Drummond*, 3d coll. n. 151; Lima, *Mathews*, *n.* 441, *Cuming*, *n.* 918, Brazil, *Sello*, and in other parts of S. America.—Very near to D. *virgatus*. D. *diffusus*, Willd. is probably the same species.

4. D. *acuminatus* (sp. n.), pubescens v. glabriusculus, caule diffuso subangulato, pinnis 1—4-jugis, foliolis 6—10-jugis, glandula majuscula ovata infra pinnas infimas, capitulis paucifloris, floribus decandris, leguminibus falcatis acuminatis lævibus 8—13-spermis.—Rio Brazos, Texas, *Drummond.*—Chiefly distinguished from D. *depressus*, by the pod, which is intermediate between those of D. *depressus* and D. *brachylobus*.

5. D. *reticulatus* (sp. n.), diffusus, pubescens, pinnis 1—4-jugis, foliolis 4—8-jugis brevibus oblongis obovatisve glauces-

centibus subtus venosis, glandula nulla v. minima infra pinnas infimas, floribus decandris, leguminibus subfalcatis reticulato-venosis 8—13-spermis, staminibus ovatis.—San Felipe, Texas, *Drummond.*—The glaucous colour of the foliage in the fresh state easily distinguishes this species (according to Drummond), and in the dry state the remarkable reticulations of the pod are not to be met with in any of the preceding.

6. D. *Jamesii* (Torr. et Gr. Fl. N. Amer. i. 402.), is unknown to me.

7. D. *brachylobus*, glabriuscula, erecta, caule angulato-striato, pinnis 6—15-jugis, foliolis 20—30-jugis, glandula infra pinnas inferiores v. omnes, floribus pentandris, leguminibus latiusculis falcatis lævibus 2—6-spermis.—*Darlingtonia brachyloba* et D. *glandulosa*, DC. Prod. ii. 443, and the synonyms quoted by Torr. et Gr. l. c. 401.—United States.

XVI. MIMOSA, *Linn. Willd.*

Flores superiores v. plerique hermaphroditi, 4—5-meri rarius 3-v. 6-meri, inferiores sæpius abortu masculi. Calyx nunc minutus inconspicuus, v. paleaceo-ciliatus pappiformis, nunc campanulatus dentibus tot quot petalis. Petala plus minusve coalita. Stamina numero petalorum æqualia v. dupla. Antheræ parvæ, suborbiculatæ. Legumen compressum, sæpius planum, valvulis 2 a margine persistente secedentibus et eo latioribus integris v. transverse articulatim divisis dehiscens, intus epulposum, inter semina subseptatum v. uniloculare. Semina funiculo filiformi appensa.—Herbæ, frutices, v. rarius arbores. Folia sensitiva, bipinnata, rarissime nulla v. ad petiolum phyllodineum reducta. Glandula petiolaris nulla nisi in perpaucis speciebus, (*Habbasiis Glanduliferis.*) Seta tamen v. tuberculum rarius glanduliforme inter pinnas sæpe adest. Petioli partiales sæpissime bistipellati. Flores sessiles, capitati v. spicati, pedunculis axillaribus v. ad apices ramorum racemosis v. paniculatis. Stamina corolla sæpius plus duplo longiora et in speciebus plerisque rosea v. alba.

Species numerosæ hic in sectiones tres distribuuntur:—

I. EUMIMOSA, *staminibus numero petalis æqualibus, leguminis valvulis articulatis v. indivisis.*

II. HABBASIA, *staminibus numero petalorum duplis, leguminis valvulis articulatis.*

III. AMERIA, *staminibus numero petalorum duplis, leguminis valvulis indivisis.*

Sect. I. EUMIMOSA, *DC.*

Flores tetrameri, in floribus paucis 5—6-meri, in speciebus perpaucis 3-meri. Stamina numero petalorum æqualia. Legumen oligospermum (sæpius 2—4-spermum), valvulis in articulos secedentibus vel indivisis. Herbæ, suffrutices v. frutices, rarissime arbores. Petioli eglandulosi. Pinnæ in plerisque unijugæ v. subdigitatim approximatæ, in paucis plurijugæ, imo rarius multijugæ. Foliolum intimum jugi infimi cujusve pinnæ sæpius multo minus v. omnino deficiens. Calyx minutus, subinconspicuus vel paleaceo-ciliatus aut pappiformis. Corolla membranacea, gamopetala, in *Lepidotis* crassior. Leguminis margo setosus v. nudus nec simplici serie uncinato-aculeatus.—Species omnes Americanæ.

§ 1. *Sensitivæ.* Pinnæ unijugæ. Foliola bijuga, majuscula, basi dimidiata, plus minusve marginata et appresse ciliata, interiore infimo minimo basi subæquali. Pedunculi solitarii v. gemini, inferiores axillares, superiores racemosi. Flores capitati in omnibus speciebus plerique tetrameri, rarius hinc inde pauci pentameri.

The first eight of the following species, not all perhaps really distinct from each other, all answer to the Linnæan character of *M. sensitiva;* the *M. albida,* and *M. floribunda,* are usually to be found in gardens under this name, whilst it is probable that one of the Brazilian ones was that which Linnæus had specially in view. As each one of these spe-

cies has already received a separate name, I have omitted altogether the specific name of *sensitiva*, at least until I can obtain satisfactory evidence, which was the one really intended by Linnæus.

1. M. *albida* (Kunth. Mim. ii. t. 1.), scandens, aculeis paucis sparsis, ramulis foliis inflorescentiaque canescenti, pubescentibus, foliolis oblique ovatis oblongisve utrinque minute puberulis capitulo pluries longioribus, legumine cano-pubescente et pilis rigidis adpressis hirsuto.—Coast of the Pacific in Peru, *Humboldt* and *Bonpland; Cuming, n.* 1025; *Mathews, n.* 440.

2. M. *floribunda* (Willd. Spec. iv. 1031.), fruticosa, aculeis sparsis retrorsis, ramis petiolisque pubescenti-pilosis, foliolis oblique ovato-oblongis acutis supra glabris subtus dense strigoso-pilosis, pedunculis capitulo subduplo longioribus, bracteolis corolla brevioribus, legumine puberulo undique setoso.—M. *racemosa*, Schlecht, Linnæa, xii. 557, (ex descr.) —Cumana, *Humboldt* and *Bonpland;* Jalapa, *Schiede.*

β. foliolis supra leviter puberulis.—Panama, *Cuming, n.* 1241.—Intermediate between M. *floribunda*, and M. *adhærens.*

3. M. *adhærens* (Humb. et Kunth, Nov. Gen. et Sp. vi. 249?) fruticosa, aculeis sparsis raris, ramis petiolisque dense ferrugineo-villosis, foliolis oblique ovatis obovatisve acutis supra pilosulis subtus adpresse strigosis v. subsericeis, pedunculis capitulo parum longioribus, bracteis corollam subæquantibus, legumine pubescente undique breviter et crebre setoso.—Ravines round Quito, *Colonel Hall.*—On the Orinoco, *Humboldt* and *Bonpland.*—Probably a variety of M. *floribunda.*

4. M. *strigosa*, (Willd. Sp. iv. 1030.) I have not seen this species, but, from the description, it can scarcely differ from M. *floribunda.* It was found by *Humboldt* and *Bonpland* on the Orinoco, with M. *adhærens.*

5. M. *malitiosa* (Mart.! Herb. Fl. Bras. 138.), fruticosa, aculeis sparsis retrorsis parvis, ramis petiolisque pubescenti-hirtis, foliolis oblique ovato-lanceolatis acutis supra minute

puberulis glabratisve subtus strigoso-villosis, pedunculis capitulo 2—3-plo longioribus, bracteis corolla parum brevioribus, legumine ferrugineo-villoso margine setoso-aculeato, valvulis subsetosis.—Calycis ciliæ corollæ dimidium æquant.—Minas Geraes, *Martius, n.* 1079, *Sello, Claussen.*

6. M. *litigiosa* (Mart.! l. c. 185.), suffruticosa, subscandens, aculeis sparsis retrorsis ramulis petiolisque puberulis, foliolis oblique ovato-lanceolatis acutis supra glabris subtus sparse strigoso-pilosis, pedunculis capitulo vix duplo longioribus, bracteolis pectinato-ciliatis corollam æquantibus v. superantibus, legumine undique longe setoso glabro vel puberulo.—M. *floribunda*, Benth. in Hook. Journ. Bot. ii. 130, non Willd.—Rio Branco, *Schomburgk, n.* 848; Bahia. *Salzmann;* Piauhy, *Gardner;* Bahia, Parà, and Rio Negro, *Martius.*

7. M. *Vellosiana* (Mart.! l. c. 185.), suffruticosa, aculeis sparsis retrorsis validis, ramis petiolisque glabriusculis, foliolis oblique ovato-lanceolatis acutis supra glaberrimis subtus sparse strigosis, pedunculis capitulo subduplo longioribus, bracteolis corolla brevioribus subæquilongisque, legumine glabro, margine longe setoso, valvulis nudis.—M. *viva*, Vell. Fl. Flum. 11. t. 33. non Linn.—Easily known by its smoothness.—Corcovado, near Rio Janeiro, *Martius, n.* 173, *Sello, Pohl.*

8. M. *obtusifolia* (Willd. Enum. ii. 1047.), herbacea v. suffruticosa, aculeis sparsis retrorsis paucis, ramis petiolisque glabris v. parce setoso-pilosis, foliolis petiolo multo brevioribus oblique obovato-oblongis obtusis supra glaberrimis subtus sparse strigosis, pedunculis capitulo 3—4-plo longioribus, bracteolis flore subbrevioribus, legumine. . . .—M. *fervida*, Mart.! Herb. Fl. Bras. 137.—Minas Geraes, *Martius, n.* 280, *Sello.*

9. M. *rixosa* (Mart. l. c. 137 ?), suffruticosa, aculeis retrorsis sparsis, ramulis petiolisque ferrugineo-hirsutis pubescentibusque, foliolis oblique obovato-oblongis obtusiusculis mucronatisque utrinque strigoso-pilosis, pedunculis capitulo duplo longioribus, bracteolis corolla brevioribus, legumine recto acuminato ferrugineo-puberulo, margine crebre valvulis parce

setosis.—Minas Geraes; *Claussen, Langsdorff, Martius?, Sello.* —Foliage nearly that of *M. floribunda,* but the pod is very different.

β. ? vestita; foliolis latioribus utrinque densius rufo-villosis.—Rio Janeiro; *Langsdorff.*

10. M. *debilis* (Humb. et Bonpl. in Willd. Spec. iv. 1029.), from Kunth's description appears to be very near *M. obtusifolia.* It is unknown to me.—Near Caripe in New Andalusia.

11. M. *paniculata* (sp. n.), fruticosa? debilis, aculeis sparsis retrorsis paucis, ramis petiolisque glabris v. parce setoso-pilosis, foliolis petiolo brevioribus oblique obovato-oblongis obtusis utrinque strigosis, pedunculis capitulo vix duplo longioribus, bracteolis corolla subbrevioribus, legumine acuminato subfalcato subglabro undique parce setoso.—Minas Geraes, *Claussen, Sello.*—Near *M. obtusifolia,* but a larger and stiffer plant, the leaves much more hairy on both sides. It is at the same time much smoother than *M. rixosa,* and the pod is different.

12. M. *glaucescens* (sp. n.), suffruticosa, inermis, glaberrima, foliolis obovato-oblongis obtusis mucronatis margine incrassato serrato-ciliatis utrinque glaucescentibus, bracteolis corolla brevioribus.—Folia pauca longe petiolata. Stipulæ lanceolatæ rigidæ. Foliola coriacea. Foliolum intimum inferius minimum est, v. omnino deest. Calyx minutissimus. Corolla glabra, glauca.—Rio Pardo, *Langsdorff.*

13. M. *nuda* (sp. n.), suffruticosa, inermis, glaberrima, foliolis oblique oblongis obtusiusculis mucronatisve margine crasso nudo utrinque glaucescentibus, bracteis flore brevioribus, legumine glaucescente glabro nudo.—A præcedente differt foliis angustioribus ($1\frac{1}{2}$ poll. longis, 4—5 lin. latis), minusve ciliatis interiore infimo omnino deficiente.—Brazil; *Pohl.*

14. M. *angusta* (sp. n.), suffruticosa, inermis, glabra, glaucescens, foliolis oblique linearibus marginatis ciliatis, bracteolis corolla brevioribus.—Foliola pleraque 1 poll. longa, vix 2 lin. lata.—Goyaz; *Gardner, n.* 3131.

§ 2. *Modestæ.* Herbæ prostratæ v. decumbentes, inermes v. aculeis infrastipularibus armatæ. Pinnæ unijugæ. Foliola paucijuga (4—5-juga), latiuscula marginata setuloso-ciliata. Leguminis articuli sæpius medio tuberculosi v. echinati.

15. M. *viva* (Linn.! Spec. 1500), herbacea, pusilla, diffusa, glabra, inermis, foliolis sub-4-jugis obovatis oblongisve, capitulis globosis, legumine ovato quadrato uni-articulato pubescenti-hirto.—Jamaica.

16. M. *ursina* (Mart. Herb. Fl. Bras. 136.), herbacea, decumbens, aculeis infrastipularibus recurvis geminis ternisve, caule petiolis pedunculisque longe patenti-pilosis, stipulis lanceolato-subulatis, pinnis petiolo sublongioribus, foliolis 4—5-jugis obliquis ovatis obtusiusculis 2—3-nerviis supra glabris subtus longe hirsutis, pedunculis axillaribus folium subæquantibus, capitulis parvis globosis, calyce minuto, leguminis articulis 2—4 pubescentibus medio convexis echinatisve, margine setuloso.—Prov. Piauhy, *Gardner, n.* 2132. (Interior of Prov. Bahia; *Martius.*)

17. M. *modesta* (Mart. l. c. 135.) herbacea, decumbens, aculeis infrastipularibus subrecurvis geminis nunc obsoletis, caule petiolis pedunculisque pubentibus et hinc inde sericeo-pilosis, stipulis late ovato-lanceolatis, pinnis petiolo brevioribus, foliolis 4—5-jugis oblique ovatis obovatisve obtusis 3—4-nerviis glaucis marginatis setuloso-ciliatis, pedunculis folio longioribus, capitulis subglobosis, calyce longe ciliato, leguminis articulis 2—4 tomentosis medio echinatis, margine inermi.—Interior of Prov. Bahia; *Blanchet, n.* 2697, (*Martius.*)

§ 3. *Castæ.* Frutices suffrutices v. herbæ, aculeis sparsis armatæ. Pinnæ unijugæ. Foliola plurijuga, marginata, setuloso-ciliata. Pedunculi folio breviores v. racemosi. Leguminis valvulæ articulatæ v. indivisæ, nudæ v. setosæ nec tuberculoso-echinatæ.—Inter *Sensitivas* et *Meticulosas* mediæ, ab his aculeis tantum differunt, et pariter species continent leguminibus articulatis et inarticulatis.

18. M. *casta* (Linn. Spec. 1500.), fruticosa, aculeis retrorsis, ramulis petiolisque glabris, foliolis 3—4-jugis oblique oblongis lanceolatisve acutis marginatis setuloso-ciliatis glabris v. subtus sparse strigosis, pedunculis vix capitulo longioribus, bracteolis corollas subæquantibus, leguminis valvulis articulatis glabris nudis, margine setoso-aculeatis.—Martinica; *Sieber, n.* 173.

19. M. *tricephala* (Cham. et Schlecht. ! Linnæa, v. 591.), fruticosa, aculeis rectis, ramis petiolis pedunculisque pubescenti-scabris, stipulis subulatis parvis, pinnis petiolo pluries longioribus, foliolis 10—15-jugis oblique ovato-oblongis mucronatis leviter marginatis setuloso-ciliatis supra glabris nitidis subtus strigosis, capitulis globosis, bracteolis corolla brevioribus, calyce longiuscule ciliato.—Mexico; *Schiede.*

20. M. *retrorsa* (sp. n.), fruticosa, divaricato-ramosa, aculeis uncinatis retrorsis, caule setulis brevibus retrorsis scaberrimo, stipulis lanceolatis, pinnis petiolo subduplo longioribus, foliolis 12—20-jugis oblongo-linearibus falcatis obtusiusculis marginatis setuloso-ciliatis utrinque glabris, bracteolis corollam subæquantibus, capitulis globosis, calyce minuto ciliato, leguminis valvulis articulatis sparse, margine dense aculeato-setosis.—Brazil; *Sello.*—Foliola 4—6 lin. longa, 1½ lin. lata, interdum leviter glaucescentia.

21. M. *dolens* (Vell. Fl. Flum. 11. t. 34.), suffruticosa, aculeis patentibus rectis nunc minimis, caule erecto subramoso petiolisque glanduloso-hirtis asperis, pinnis petiolo pluries longioribus, foliolis 10—12-jugis oblique oblongis obtusis mucronatisve coriaceis marginatis setuloso-ciliatis glabris v. subtus inferioribus strigosis, capitulis globosis hirtis, bracteolis corollas æquantibus superantibusve, calycibus longiuscule ciliatis, legumine undique dense setoso valvulis indivisis.—Prov. Minas, and Rio Janeiro; *Martius, Sello.*—The specimen received from Martius with the n. 1090, and marked in his catalogue "*M. meticulosa, Mart. var. major ?*" appears to me to be referrible to *M. dolens,* it has both the prickles and glandular hairs of this species, and Martius describes his *M. meticulosa* as being without either.

22. M. *insidiosa* (Mart. Herb. Fl. Bras. 134.), herbacea v. suffruticosa, aculeis patentibus rectis raris, caule erecto subsimplici petiolisque strigoso-hispidis eglandulosis, pinnis petiolo multo longioribus, foliolis 20—25-jugis oblique oblongis acutis mucronatis coriaceis marginatis setuloso-ciliatis glabris v. subtus inferioribus strigosis, capitulis globosis hirtis, bracteolis corollas æquantibus calycibus, longiuscule ciliatis, legumine undique dense setoso setis marginalibus validioribus.—Minas Geraes; *Martius, Claussen.*—I have little doubt that this is Martius' plant though I have not seen his own specimens. It differs from the last in the number of leaflets and the nature of the hairs.

23. M. *oblonga* (sp. n.), fruticosa? ramosa, aculeis tenuibus recurvis raris, caule pedunculisque patentim setoso-hispidis et pube brevi canescentibus, petiolo brevissimo, foliolis 25—35-jugis linearibus mucronulatis leviter marginatis ciliatis utrinque glabris v. subtus pube minute pallidis, capitulis cylindraceis, bracteis corolla brevioribus, calycibus minutis ciliatis.—Stipulæ setaceæ, ciliato-hispidæ. Foliola $1\frac{1}{2}$—3 lin. longa. Pedunculi tenues. Capitula (v. spicæ) semipollicaria. Corolla strigis reversis canescens.—Brazil; *Sello.*—A very distinct species, unless it be a prickly form of *M. hirsutissima*, Mart., with which I am unacquainted. The prickles are however small and only on the younger branches.

§ 4. *Pectinatæ.* Arbores, frutices v. herbæ, aculeis omnibus v. nonnullis infrastipularibus armatæ. Pinnæ unijugæ. Foliola pluri-v. sæpius multijugæ. Inflorescentia et legumen *Castarum* v. *Sensitivarum.*—Inter has et *Meticulosas*, media. A *Sensitivis* foliolis multijugis, a *Castis* aculeis infrastipularibus, a *Meticulosis* aculeis diversa.

24. M. *orthacantha* (sp. n.), fruticosa, ramosa, glaberrima v. superne minute puberula, aculeis infrastipularibus solitariis ternisve rectis erecto-patentibus, pinnis petiolo longioribus, foliolis 8—10-jugis oblique cuneato-oblongis linearibusve obtusis uninerviis immarginatis nudis, capitulis globosis glaberrimis, bracteolis corolla multo brevioribus, calyce minuto.—

Species distinctissima, habitu *Ameriis* nonnullis affinis, sed flores *Eumimosarum*. Legumen ignotum. Foliola 1—2½ lin. longa, utrinque viridia.—Brazil; *Sello*.

25. M. *pectinata* (Kunth. Mim. 5. t. 2.), arborea, aculeis infrastipularibus geminis rectis, ramulis villoso-hispidis, pinnis petiolo multo longioribus, foliolis 23—25-jugis oblique linearibus acutis binerviis coriaceis glabris marginatis setuloso-ciliatis, capitulis globosis, bracteolis corolla brevioribus, calycibus longe ciliatis.—Andes of Quito; *Humboldt and Bonpland*.

26. M. *polycarpa* (Kunth. Mim. 8. t. 3.), fruticosa, aculeis infrastipularibus geminis rectis, ramulis pilosis, pinnis petiolo triplo longioribus, foliolis 20—22-jugis oblique oblongo-linearibus acutis supra glabris subtus adpresse pilosiusculis marginatis setuloso-ciliatis, capitulis globosis, bracteolis corollam superantibus, calyce parvo, legumine lineari-oblongo piloso-hispido, margine setoso.—Peru; *Humboldt and Bonpland*.—I have not seen either this or the preceding species; but as they are evidently very distinct species, I have taken the above characters from Kunth's descriptions.

27. M. *Mansii* (Mart.! Herb. Fl. Bras. 130), annua? decumbens, aculeis infrastipularibus sparsisque parvis rectis, caule petiolis pedunculisque strigosis, pinnis petiolo pluries longioribus, foliolis 20—40-jugis oblique linearibus acutiusculis supra glabris margine setulosis subtus adpresse pilosis, capitulis ellipticis parvis, bracteis corolla brevioribus, calycibus minimis longe ciliatis pappiformibus, leguminis valvulis levibus, margine strigoso-setoso.—Cujaba; *Martius*, *n*. 221.

28. M. *Xanthocentra* (Mart. l. c. 131.), from Piauhy, agrees in every respect with the following, except that he describes the leaflets as being only 20—28 pair, and the valves of the pod entirely smooth, which induces me to consider it as distinct.

29. M. *longipinna* (sp. n.), perennis v. suffruticosa, aculeis infrastipularibus subsparsisque, ramis virgatis strigosis, pinnis petiolo pluries longioribus, foliolis 30—70-jugis linearibus falcatis acutis marginatis setuloso-ciliatis utrinque ad-

presse pilosis, capitulis subglobosis, bracteolis corolla brevioribus, calyce minuto longe ciliato pappiformi, leguminis valvulis medio strigoso-setosis margine longe aculeato-setoso. —Minas Geraes; *Claussen*.

§ 5. *Pudicæ*. Herbæ suffruticesve, aculeis omnibus v. nonnullis infrastipularibus armatæ, rarius subinermes. Pinnæ 2—4-jugæ, ad apicem petioli approximatæ v. parum distantes subdigitatæ. Foliola multijuga, marginata. Pedunculi axillares folio breviores, v. racemosi. Legumen præcedentium.

Pinnæ subdigitatæ.

30. M. *Pudica* (Linn.! Spec. 1501.), annua v. suffruticosa, aculeis infrastipularibus sparsisque rectis recurvisque, caule petiolis pedunculisque patentim pilosis glabratisve, pinnis subdigitato-bijugis v. supremis unijugis petiolo vix longioribus, foliolis 15—25-jugis oblique linearibus acutiusculis setuloso-ciliatis glabris v. subtus adpresse pilosis, capitulis ellipticis, bracteolis corolla brevioribus, calycibus minimis obsoletisve, leguminis valvulis glabris lævibus margine aculeato-setoso.—Common in the W. Indies, and in tropical America on roadsides, etc. (Panama, *Cuming, n.* 1092*;* Bahia, *Gardner, n.* 889,) and frequently cultivated, and perhaps sometimes naturalized in E. India, (*Wallich. Cat. n.* 4292*;* Philippine islands, *Cuming, n.* 1261, *and* 1372*)*.—It varies much in hairiness; the smoother forms are the M. *pudica*, Kunth, or M. *pudibunda*, Willd., the more hairy are the M. *pudica*, Linn., Willd., or M. *hispidula*, Kunth.

31. M. *Endymionis* (Mart. Herb. Fl. Bras. 131.), from the interior of the province of Bahia, is unknown to me; but from his description, I am unable to see how it differs from the smoother forms of M. *pudica*.

32. M. *polydactyla* (Humb. et Bonpl. in Willd. Spec. iv. 1033.), suffruticosa, aculeis infrastipularibus sparsisque recurvis, caule petiolisque pilis suberectis hirsutis glabrisve, pinnis subdigitato-4—5-jugis v. supremis 3-jugis petiolo vix longioribus, foliolis 30—60-jugis oblique linearibus acutius-

culis setuloso-ciliatis subtus adpresse pilosis glabrisve, pedunculis petiolo brevioribus, capitulis ellipticis, bracteolis corolla brevioribus, calycibus minimis obsoletisve, leguminis valvulis glabris lævibus, margine aculeato-setoso.—A large and more robust plant than M. *pudica*, to which it is nearly allied.—Demerara, *Parker;* French Guiana, *Leprieur;* Bahia, *Salzmann;* Pernambuco, *Gardner, n.* 980, (with fewer leaflets.)

33. M. *digitata* (sp. n.), suffruticosa? decumbens, aculeis infrastipularibus parvis v. nullis, caule scabro-pubescente v. nullo, pinnis subdigitato-3—4-jugis petiolo duplo longioribus, foliolis 15—20-jugis oblique linearibus acutiusculis supra glabris cilioliats subtus adpresse pilosis, pedunculis petiolo 2—3-plo longioribus, calycibus longe ciliatis pappiformibus, legumine nudo glabro v. adpresse piloso.—Pubes ramorum brevis densa. Stipulæ subulatæ. Petiolus communis 3—4-rarius 6, lin. longus. Foliola 1—1½-lin. longa densa. Legumen fere M. *pudicæ*, sed setis orbatum.—Brazil, *Pohl.*

34. M. *verecunda* (sp. n.), suffruticosa? aculeis infrastipularibus sparsisque raris, caule petiolisque pubentibus et pilis reflexo-patentibus hispidis, pinnis 2—3-jugis ad apicem petioli approximatis v. parum distantibus et eo 2—3-plo longioribus, foliolis 30—60-jugis oblique linearibus acutiusculis utrinque adpresse pilosulis ciliatis, pedunculis petiolo subæquilongis, capitulis subglobosis, bracteolis corolla brevioribus, calyce longe ciliato pappiformi, leguminis puberuli valvulis breviter, margine longe, setosis.—Habitu et legumine M. *pudicæ* et M. *polydactylæ* affinis. Pinnæ minus approximatæ. Stipulæ subulatæ hirsutissimæ. Foliola parva. Setæ leguminis flavicantes, marginales usque ad 2 lin. longæ, valvulares breves sæpius appressæ.—Brazil, *Pohl.*

35. M. *rufipila* (sp. n.), suffruticosa? aculeis infrastipularibus sparsisve raris v. nullis, caule petiolis pedunculisque patentim hirsutissimis, pinnis 4—5-jugis subdigitatis petiolo multo longioribus, foliolis 20—30 oblique linearibus ciliatis supra glabris subtus adpresse pilosis, pedunculis petiolo multo longioribus, capitulis ellipticis, bracteolis corollam

æquantibus, calyce minuto subciliato v. obsoleto, leguminis margine setosissimo.—Præcedentibus robustior et pilis longis ferrugineis hispidissima. Foliola 3—4-lin. longa. Capitula majora ac in præcedentibus, bracteolarum setis rufo-hispida. Leguminis nil nisi margines vetustos persistentes vidi.—Brazil, *Pohl.*

36? M. *tomentosa* (Kunth. Mim. 11. t. 4.), fruticosa, inermis, ramis petiolis pedunculisque sericeo-villosis, pinnis 2-jugis subdigitatis petiolo multo longioribus, foliolis 16—18-jugis oblongis acutis utrinque villoso-sericeis cano-argenteis, pedunculis petiolo longioribus, capitulis ellipticis, bracteolis corolla brevioribus, calyce diaphano laciniato-ciliato.—On the Orinoco, *Humboldt* and *Bonpland.*—The above character, taken from Kunth's description, shows it to be a very distinct species, perhaps not belonging to this group. The pod is unknown.

** *Pinnæ remotiores. Pedunculi longiores.*

37. M. *vestita* (sp. n.), suffruticosa, inermis, caule petiolis pedunculisque patentim hirsutissimis et pubentibus, pinnis subapproximatis, petiolo brevissimo, foliolis 8—12-jugis late oblongis obliquis obtusis subbinerviis utrinque hirsutis, pedunculis infimis axillaribus folio longioribus superioribus racemosis, capitulis globosis, bracteolis corolla brevioribus, calyce obsoleto.—Habitus fere *Meticulosarum*; sed pinnæ constanter bijugæ. Pili longi, patentes, rufescentes. Stipulæ setaceæ, hispidæ. Foliola pleraque 3-lin. longa, 2-lin. lata.—Brazil, *Pohl.*

38. M. *elongata* (sp. n.), suffruticosa, inermis, ramis petiolis pedunculisque piloso-hirtis, pinnis 3—4-jugis distantibus, foliolis 20—30-jugis falcato-lanceolatis linearibusve dimidiatis acutis ciliatis supra glabris subtus adpresse pilosis, pedunculis folio brevioribus supremis racemosis, capitulis subglobosis, bracteolis corolla subbrevioribus, calyce minuto.—Laxior et multo minus hirsuta quam M. *vestita*, capitulis dimidio minoribus. Stipulæ lanceolatæ.—Brazil, *Pohl.*

39. M. *dispersa* (sp. n.), suffruticosa, decumbens, inermis,

ramis petiolis pedunculisque longe patentim pilosis pubentibusque, pinnis 2—3-jugis subdistantibus petiolo vix longioribus, foliolis 6—12-jugis oblique oblongis lanceolatisve ciliatis supra glabris subtus adpresse pilosis, pedunculis infimis folio subbrevioribus supremis racemosis, capitulis globosis, bracteolis corollam subæquantibus, calyce paleaceo laciniato-ciliato.—Habitu M. *elongatæ* affinis, sed capitula majora et calycis ciliæ corolla parum breviores sunt. Stipulæ subulatæ. Accedit etiam ad M. *nervosam*, sed distincta videtur.—Brazil, *Sello;* Tejuco, *Langsdorff.*

40? M. *nervosa* (Bongard, MSS.), suffruticosa? prostrata, aculeis infrastipularibus parvis deciduis, caule petiolis pedunculisque patentius pilosis glabratisve, pinnis 1—2-jugis subdistantibus petiolo longioribus, foliolis 6—12-jugis oblique oblongis lanceolatisve acutiusculis ciliolatis glaucis glabris v. subtus adpresse pilosis rigide 3—5-nerviis, pedunculis axillaribus folio sublongioribus, capitulis globosis, bracteolis corollas subæquantibus, calyce paleaceo lacero-ciliato, leguminis valvulis puberulis v. breviter setosis margine longius setoso.—Species inter *Pudicas*, *Flagellares* et *Meticulosas* media, a *Meticulosis* differt pinnis sæpe bijugis, aculeis et quodammodo habitu. Hic *Flagellaribus* affinior sed aculeis et pedunculis supremis subracemosis discrepat. Cum *Pudicis* tamen vix convenit habitu. Stipulæ subulatæ. Foliola 3—4-lin. longa. Capitula *M. dispersæ*.—Brazil, *Pohl;* Minas Geraes, *Claussen*, *Langsdorff.*

§ 6. *Pedunculosæ.* Herbæ v. sæpius suffrutices, reptantes, prostratæ v. diffusæ, inermes. Pinnæ unijugæ v. rarius subdigitato-bijugæ. Foliola pluri-sæpius multijuga. Pedunculi omnes axillares, folio longiores v. rarius subbreviores. Capitula globosa. Legumen præcedentium.

* FLAGELLARES, *longe patentim-pilosæ, foliolis marginatis ciliatis.*

41. M. *longipes* (sp. n.), pinnis petiolo pluries brevioribus, foliolis 12—20-jugis oblique lanceolatis v. oblongo-line-

aribus acutiusculis supra glabris subtus parce pilosis glabrisve, pedunculis folio duplo longioribus, bracteolis corollam subæquantibus, calyce abbreviato ciliis paucis longiusculis.—Pili longi, molles, rufescentes. Stipulæ lanceolatæ, breves. Petioli semipedales. Foliola 4—6 lin. longa. Pedunculi pedales. Flores sæpius pentameri, rarius 4-meri v. 6-meri. —Brazil, *Pohl.*

42. M. *falcipinna* (sp. n.), pinnis petiolo longioribus, foliolis 15—20-jugis dimidiato-oblongis falcatis obtusiusculis margine crasso supra glabris subtus parce et longe setoso-pilosis, pedunculis folio longioribus, bracteolis corolla subbrevioribus, calyce minuto v. obsoleto.—Pili quam in affinibus adhuc longiores rigidiores. Stipulæ lanceolato-subulatæ. Petioli pollicares. Foliola 3—4-lin. longa. Pedunculi tripollicares.—Brazil, *Pohl.*—A young specimen in Sello's collection may perhaps also be the same plant.

43. M. *barbigera* (sp. n.), pinnis petiolo longioribus, foliolis 12—18-jugis falcato-oblongis obtusiusculis margine tenui supra glabris subtus parce pilosis, pedunculis folio subæquilongis, bracteolis corolla brevioribus, calyce paleaceo laciniato-ciliato corolla parum breviore, leguminis valvulis glabris nudis, margine setoso.—Affinis M. *falcipinnæ.* Pili caulini longissimi, molles. Petioli pollicares. Pedunculi circa 2 poll. longi. Legumina interdum 5—6-articulata.—Prov. Goyaz, *Gardner, n.* 3132.

44. M. *procurrens* (sp. n.), pinnis subdigitato-bijugis rarius unijugis petiolo 2—3-plo longioribus, foliolis 10—15-jugis oblique ovali-oblongis obtusiusculis supra glabris margine tenui subtus sparse pilosis, pedunculis folio æquilongis, bracteolis corolla subbrevioribus, calyce obsoleto v. hinc inde minuto longe ciliato.—Petioli $\frac{3}{4}$—$1\frac{1}{2}$-pollicares. Foliola semipollicaria, $2\frac{1}{2}$-lin. lata. Pedunculi 4-pollicares.—Brazil, *Pohl.*

45. M. *marginata* (Lindl.! Bot. Reg. 1838. Misc.), pinnis petiolo multoties longioribus, foliolis 10—20-jugis oblique oblongis obtusiusculis utrinque glabris v. subtus tenuissime

strigillosis, pedunculis folio multo longioribus, bracteolis corolla brevioribus, calycibus brevissimis longiuscule ciliatis, legumine undique setoso-hispidissimo.—M. *prostrata*, Hortul. —Brazil, *Sello*.

46. M. *flagellaris* (sp. n.), parce pilosa, pinnis petiolo pluries longioribus, foliolis 4—7-jugis oblique obovatis oblongisve utrinque glabris, pedunculis folio 2—3-plo longioribus, bracteolis corollas æquantibus, calyce obsoleto, leguminis valvulis glabris nudis, margine setoso.—Stipulæ lanceolatæ. Petiolus vix semipollicaris. Foliola sæpius semipollicaria, quam in affinibus latiora. Pedunculi 4—5-poll. longi. Corollæ globosæ.—Near Porto Alegre, *Tweedie*; Brazil, *Sello*.

47. M. *honesta* (Mart. Herb. Fl. Bras. 137.), appears from Martius's character to be near M. *flagellaris*, but more hairy, with longer petioles, and shorter peduncles.—From the province of Bahia.

48. M. *paupera* (sp. n.), prostrata, tenuis, pilis paucis subpatentibus, pinnis petiolo subbrevioribus, foliolis 4—8-jugis falcato-oblongis obtusiusculis supra glabris subtus sparse setosis, pedunculis folio longioribus, bracteolis corolla brevioribus, calyce minuto subciliato, legumine undique breviter strigoso.—Caules vix pedales, basi scabri, sursum pilis subappressis hirti. Stipulæ angustæ, ciliatæ. Petioli 6—9-lin. longi. Foliola 2—3-lin. Pedunculi 1½ poll., tenues, rigidi, patentim pilosi. Corollæ strigosæ.—Brazil, *Sello*.

49. M. *reptans*, (sp. n.), reptans, parce pilosa et subpubens, petiolo brevissimo, foliolis 12—20-jugis parvis oblique oblongo-linearibus glabris v. subtus pilosulis, pedunculis folio duplo longioribus, bracteolis corolla multo brevioribus, calyce minuto, leguminis valvulis strigoso-setulosis, margine aspero-hirto.—Caules tenues hinc inde radicantes. Stipulæ angustæ. Pinnæ ½—1-poll. longæ; foliola 1—2-lin. Pedunculi 1½—2-poll.—Near Maldonado, *Tweedie*; Brazil, *Sello*.

50. M. *lasiocephala* (sp. n.), procumbens, molliter piloso-pubescens, petiolo subnullo, foliolis 10—15-jugis oblongo-linearibus ciliolatis supra glabriusculis subtus pilosulis, pe-

dunculis folio longioribus, capitulis molliter villosissimis, bracteolis corolla longioribus, calyce minuto, leguminis valvulis strigoso-setulosis, margine aspero-hirto.—Præcedenti affinis, specimen unicum non radicat. Capitula (bracteolarum ciliis) canescenti-villosissima.—Brazil, *Sello.*

** FILIPEDES, *glabræ, diffusæ, caule petiolis pedunculisque filiformibus.*

51. M. *multiplex* (sp. n.), ramosissima, diffusa, tenuis, pinnis petiolo filiformi brevioribus, foliolis 5—8-jugis oblique oblongis ellipticisve obtusiusculis tenuissime ciliatis glabris v. subtus raro adpresse pilosulis, pedunculo tenui petiolum æquante, bracteolis corollam æquantibus, calyce minuto.—Siccitate nigricat. Petioli sesquipollicares; pinnæ pollicares; foliola 2—3-lin. longa, nunc glaucescentia.—Brazil, *Sello.*

52? M. *filipes* (Mart. Herb. Fl. Bras. 132.), annua, tenella, glabra, pinnis petiolo filiformi duplo brevioribus, foliolis 4—5-jugis anguste obovatis cuneatisve, pedunculis petiolo brevioribus, legumine 7—8-articulato.—Prov. Piauhy, *Martius,* from whose character I have extracted the above, not having seen the plant myself.

53. M. *diffusa* (sp. n.), glaberrima, diffusa, tenuissima, pinnis petiolo filiformi vix longioribus, foliolis 20—30-jugis oblique linearibus subfalcatis, pedunculis filiformibus petiolo subæquilongis, bracteolis brevissimis, calyce parvo cupuliformi.—Petioli 7—9-lin. longi; pinnæ pollicares; foliola crebra 1—2 lin. longa, non ciliata; nec in capitulo setæ ullæ obviæ sunt.— Brazil, *Sello.*

§ 7. *Polycephalæ.* Frutices? inermes. Folia *Meticulosarum.* Capitula parva, numerosa, secus ramos paniculæ amplæ aphyllæ subsessilia. Legumen ignotum.

54. M. *taxifolia* (Bongard MS.), ramis petiolis paniculaque adpresse sursum strigosis, pinnis unijugis, petiolo communi subnullo, foliolis 15—20-jugis oblique oblongo-linearibus falcatis acutiusculis multinerviis coriaceis glaucis glabris ciliatis, bracteolis corolla brevioribus, calyce paleaceo laciniato-

ciliato.—Pinnæ sesquipollicares v. parum longiores. Foliola 3 lin. longa, inferiora et superiora minora. Panicula pedalis.—" Chapada," in Brazil, *Langsdorff*.

55. M. *polycephala* (sp. n.), ramis petiolis paniculaque pilis rufis erectis villosis, pinnis unijugis petiolo communi subnullo, foliolis 30—40-jugis oblique oblongo-linearibus obtusiusculis coriaceis multinerviis utrinque adpresse villosis, bracteolis corolla subbrevioribus, calyce paleaceo longiuscule laciniato-ciliato.—Affinis *M. taxifoliæ*. Pinnæ duplo longiores. Foliola longius ciliata.—Prov. of Pernambuco, *Gardner*, *n*. 2832.

The two preceding species are remarkable for their inflorescence; but not having seen their fruit, I cannot be certain as to their being correctly placed near the *Meticulosæ*, with which they appear to have considerable affinity in other respects.

§ 8. *Meticulosæ*. Herbæ v. suffrutices e basi perenni v. lignosa erecta, virgata, rarius frutices ramosi. Aculei nulli. Pinnæ unijugæ. Foliola multijuga, rigida, bi-plurinervia, marginata, ciliata. Pedunculi omnes racemosi v. infimi axillares. Capitula globosa v. rarius elliptica. Bracteolæ longe setosæ, setis corollas sæpius superantibus. Legumen planum v. leviter convexum, valvulis integris v. articulatis.

In this group I include all the unarmed species with one pair of pinnæ and several pair of leaflets, and a racemose inflorescence, which have neither the stellate hairs of the *Lepidotæ*, nor the reversed strigæ of the *Obstrigosæ*. The species, mostly Brazilian, are numerous and very difficult to arrange in the present state of our acquaintance with them. It is probable that when the fruit of more species is known, these and the *Pectinatæ* may be broken up into better characterized and more natural series; but at present I cannot discover any collateral character to distinguish those which have the articulate pod from the inarticulate ones, without seeing the pod itself. Of the five following groups, derived chiefly from the foliage, the first two contain certainly species with both descriptions of pod: in the third and fourth it is articulate wherever I have seen it, and in the fifth inarticulate. Yet it is unknown in so many, that I can place no reliance on this character.

* *Glaucæ.* Foliola coriacea glauca utrinque glabra nisi extimum jugi infimi cujusve pinnæ subtus setulosum. Capitula sæpius magna.

56? M. *calocephala* (Mart. Herb. Fl. Bras. 133.), and

57? *M. hypoglauca* (Mart. l. c.), Prov. Minas Geraes and Bahia, *Martius.*

I cannot recognise either of these species in any of the specimens before me. They are found together and are said to be nearly allied to each other. Independently of the characters derived from the foliage and hairiness, all the following species are racemose, not corymbose. The only specimens where I have observed any approach to the corymbose inflorescence (the racemose being much shorter,) are among the *Eriocaules;* but in those the leaflets are scarcely glabrous, and not near so glaucous, besides that there is no species among them at all resembling my *M. rigida.*

58. *M. Pohlii* (sp. n.), ramis virgatis petiolisque lana longa densa sordida obtectis, petiolo communi brevissimo, foliolis 30—40-jugis oblique oblongo-lanceolatis, racemo terminali oligocephalo nudo, capitulis magnis, bracteolis corollas æquantibus, calyce paleaceo laciniato-ciliato, legumine undique molliter villosissimo pilis marginalibus rigidioribus. —Pinnæ semipedales. Foliola vix 5 lin. longa. Pedunculi pollicares, crassi, dense lanati. Capitula pollicem diametro. Corollæ 3½ lin. longæ et calyces vix breviores. Legumen 4—6 lin. longum, distincte biarticulatum.—Brazil, *Pohl.*

59. M. *papposa* (sp. n.), ramis virgatis petiolisque dense strigosis, petiolo communi brevissimo, foliolis 20—40-jugis oblique oblongo-linearibus falcatis obtusis, racemo elongato polycephalo nudo, bracteolis corolla subbrevioribus, calyce longe ciliato pappiformi, legumine undique longe villosissimo. —Hirsutis densa rigida sursum appressa. Pinnæ bipollicares. Foliola densa, 2—3 lin. longa. Racemus sesquipeda-

lis. Capitula (staminibus neglectis,) 4—5 lin. diametro.—Brazil, *Pohl.*

60. M. *setipes* (sp. n.), ramis virgatis petiolis pedunculisque sparse setosis, petiolo communi brevissimo, foliolis 30—50-jugis oblique lanceolatis acutis, racemo oligocephalo nudo, bracteolis corollam æquantibus, calycibus obsoletis, legumine undique dense setoso, valvulis inarticulatis.—Pinnæ 3—4 pollicares, petiolo communi vix semipollicari v., in foliis infimis, breves, paucifoliolatæ, petiolo longiore. Foliola 3—4 lin. longa. Capitula majuscula.—Brazil, *Sello.*

61. M. *callosa* (sp. n.), caule virgato foliis pedunculisque glabris glaucis, pinnis petiolo 2—4-plo longioribus, foliolis 30—50-jugis oblique ovato-lanceolatis acutis, racemo oligocephalo nudo, bracteolis corollam æquantibus, calycibus parvis, legumine undique longe et dense setoso, valvulis indivisis.—Affinis præcedenti, petioli longiores basi calloso-incrassati, partiales parce setosi.—Brazil, *Sello.*

62. M. *petiolaris* (sp. n.), caule virgato paucifoliato sparse strigoso-setuloso, pinnis petiolo brevioribus v. vix æquilongis, foliolis 12—20-jugis oblique oblongis subfalcatis obtusis vix glaucescentibus, racemo longiusculo nudo, bracteolis corolla brevioribus, calyce paleaceo laciniato-ciliato.—Folia ad basin caulis pauca, petiolo communi 3—6 poll. longo, foliolis 4—5 lin. longis. Racemus longe pedunculatus. Capitula minora quam in præcedentibus, longiuscule pedunculata.—Brazil, *Pohl.*

63. M. *rigescens* (sp. n.), caule virgato petiolisque sparse setosis glabris v. superne pubentibus hispidisque, pinnis petiolo 2—4-plo longioribus, foliolis 10—12-jugis oblique ovali-oblongis obtusis mucronulatis, racemo oligocephalo nudo v. vix basi foliato, bracteolis corollas æquantibus, calycibus brevibus ciliatis, legumine undique longe setoso, valvulis indivisis.—*M. dolenti* habitu affinis at constanter inermis. Petioli communes in foliis superioribus vix semipollicares, in inferioribus 1—1½-pollicares. Foliola semipollicaria plus minusve glaucescentia. Capitula majuscula.—Brazil, *Sello;* on the Rio Jacquhy, *Tweedie.*

β. *foliolosa*, foliolis minoribus 12—15-jugis.—Brazil, *Sello.*

64. M. *rigida* (sp. n.), caule virgato glabro v. parce setuloso, petiolis strigosis communi pinnis 3—4 plo breviore, foliolis 10—12-jugis dimidiato-oblongis falcatis acutis, racemo terminali nudo, capitulis majusculis globosis, bracteolis corollas æquantibus, calyce brevi longiuscule laciniato-ciliato.—Rami adsunt rigidi, pluripedales, subramosi, crassi. Pinnæ semipedales, foliolis sæpe sesquipollicaribus. Racemus fere pedalis. Capitula (staminibus neglectis) ¾ poll. diametro.—Brazil, *Sello, Martius, n.* 1090, under the name of *M. calocephala, Mart. var. major?* but does not agree with the character assigned to the latter species.

** *Rudes.* Foliola utrinque scabro-hispida non glaucescentia.

65. M. *rudis* (sp. n.), caule virgato paucifoliato petiolisque scabro-hispidis, pinnis petiolo vix longioribus, foliolis 5—7-jugis oblique ovato-lanceolatis falcatis utrinque scabro-hispidis racemo nudo, capitulis breviter pedunculatis, bracteolis corollam æquantibus, calyce obsoleto.—Caules 2—4-pedales. Petioli semipedales. Foliola pleraque 2—2½-pollicaria. Capitula pauca, majuscula.—Brazil, *Sello.*

66. M. *asperrima* (sp. n.), caule virgato petiolisque scabro-hispidis, pinnis petiolo subduplo longioribus, foliolis 7—10-jugis oblique oblongis mucronatis utrinque scabro-hispidis, racemo elongato nudo, pedunculis capitulo duplo longioribus, bracteolis corollam æquantibus, calyce obsoleto.—Forte varietas *M. rudis.* Foliola dimidio minora.—Brazil, *Sello.*

67. M. *radula* (sp. n.), caule virgato petiolisque scabro-hispidis, pinnis inferioribus petiolo duplo longioribus, foliorum superiorum subsessilibus, foliolis 5—7-jugis oblique ovali-oblongis acutiusculis subfalcatis utrinque scabris subhispidis, racemo elongato nudo, capitulis brevissime pedunculatis, bracteolis corollam æquantibus, calyce paleaceo laciniato-ciliato.—Affinis *M. rudi,* sed calyce facile distinguitur. —Brazil, *Pohl.*

68. M. *calycina* (sp. n.), caule virgato petiolisque scabro-hispidis pilosisque, petiolo communi subnullo v. in foliis

infimis brevissimo, foliolis 8—10-jugis oblique ovato-oblongis acutiusculis utrinque scaberrimis et strigoso-hispidis, racemo elongato nudo, capitulis pedunculatis, bracteolis corollam subæquantibus, calyce paleaceo laciniato-ciliato corolla parum breviore.—Affinis *M. radulæ.* Foliola maxima pollicaria. Variat pilis caulinis nunc paucis scabritie intermixtis, nunc longis rufis densissimis.—Brazil, *Pohl;* Minas Geraes, *Claussen.*

69. M. *dimidiata* (sp. n.), caule virgato petiolisque scabro-tomentellis et longe setosis, petiolo communi brevissimo, foliolis 12—15-jugis distantibus ovato-lanceolatis falcatis acutis utrinque strigoso-hispidis ciliis marginalibus rigidis, racemo subnudo, capitulis pedunculatis, bracteolis corollam æquantibus, calyce paleaceo laciniato-ciliato.—Præcedentibus affinis. α. *M. calycina* differt præcipue foliolis minoribus (semipollicaribus) acutioribus, nervis validis, setis rigidis etc.—Brazil, *Pohl.*

70. M. *acerba* (sp. n.), caule virgato petiolisque scabro-hispidis, pinnis petiolo pluries longioribus, foliolis 15—30-jugis oblique oblongis mucronatis utrinque scabro-hispidis, racemo nudo, bracteolis corollam æquantibus, calyce parvo v. obsoleto, legumine undique densissime setoso valvulis indivisis.—Caules bipedales, inferne ramosi. Stipulæ ut in plerisque affinibus lineari-subulatæ, acuminatæ, hispidæ. Petiolus 3—4 lin., pinnæ 1½—2-poll., foliola 3 lin. longa, margine crassiusculo.—Racemus semipedalis, oligocephalus.—Brazil, *Sello;* Tejuco, *Langsdorff.*

β. *latifolia*, foliolis latioribus paullo majoribus, capitulis majoribus hirsutioribus.

71. M. *hirsutissima* (Mart. Herb. Fl. Bras. 135.), from the Prov. of St Paul—if it belongs to this group, which it appears to do—is distinguished from the others by the elliptical heads of flowers.

72. M. *imbricata* (sp. n.), caule virgato crasso molliter pilosissimo, petiolo communi subnullo, foliolis 10—15-jugis imbricatis falcato-oblongis acutiusculis supra strigosis subtus pilosissimis, racemo subnudo, capitulis pedunculatis, bracteo-

lis corollam æquantibus, calyce subpaleaceo laciniato-ciliato. —Affinis *M. radulæ* et *M. calycinæ*, at hirsutior, mollior. Folia crebra. Foliola semipollicaria, arcte approximata, pallida v. subglaucescentia. Racemus elongatus, polycephalus. Capitula majuscula.—Brazil, *Pohl.*—There are also in the same collection specimens not yet in full flower, of either a variety, or perhaps a distinct species, with smaller and more numerous leaflets.

*** *Subsericeæ.* Foliola supra breviter subtus longe adpresso-pilosa, margine sæpius tenui. Legumen (in omnibus ?) articulatum.

73. M. *lanata* (sp. n.), caule virgato petiolis pedunculisque longe et dense lanatis, petiolo communi brevi, foliolis 15—20-jugis oblique oblongis v. oblongo-linearibus obtusis supra strigosis subtus molliter et longe pilosis, pedunculis racemosis inferioribus axillaribus, capitulis lanato-hirsutissimis, bracteolis corollas æquantibus, calycibus longe ciliatis pappiformibus, leguminis valvulis articulatis longe pilosissimis, margine longe setosissimo.—Lana longa subferruginea. Stipulæ basi latæ apice subulatæ. Pinnæ bipollicares, petiolo communi vix 2—3 lin. longo. Foliola 3—4 lin. longa. Legumina 2—3 articulata, setis flavicantibus.—Brazil, *Sello.*

74. M. *subvestita* (sp. n.), subramosa, ramulis petiolis pedunculisque ferrugineo-hirtis, stipulis lineari-lanceolatis, petiolo abbreviato, foliolis 8—10-jugis oblique obovato-oblongis obtusis supra tenuiter puberulis subtus basi præsertim longe villosis, racemis subnudis, capitulis ellipticis ? bracteolis corollam subæquantibus, calyce obsoleto, legumine undique ferrugineo-hispido, valvulis articulatis.—Pinnæ vix sesquipollicares. Foliola majora fere semipollicaria, supra demum glabriuscula et subglaucescentia. Capitula in specimine vix florida. Legumen 3—4-articulatum.—Serra da Lapa; *Langsdorff.*

75. M. *setistipula* (sp. n.), ramulis petiolisque ferrugineo-hirtis, stipulis subulatis, petiolo communi brevissimo, foliolis 10—15-jugis oblique oblongis acutiusculis supra breviter subtus longe appresso-pilosis, racemis subnudis, capitulis

globosis, bracteolis corolla brevioribus, calyce obsoleto, legumine undique ferrugineo-hispido.—Præcedentis forte mera varietas est. Habitu *M. goyazensi* affinior, sed imprimis calyce distincta.—Serra da Lapa, *Langsdorff.*

76. M. *Goyazensis* (sp. n.), ramulis strictis petiolisque pilis longis patentibus scabro-hispidis pubentibusque, stipulis subulatis, petiolo brevissimo, foliolis 15—30-jugis oblique oblongis acutiusculis utrinque adpresso-pilosis, pedunculis capitulo longioribus, fasciculatis infimis axillaribus, bracteolis corollam æquantibus, calycibus longe ciliatis pappiformibus.—Pinnæ 2—4-pollicares. Foliola maxima semipollicaria, ultima cujusve pinnæ 3—4-lin. longa. Capitula (staminibus neglectis,) 3 lin. diametro.—Prov. Goyaz, *Gardner, n.* 3705.

77. M. *tremula* (sp. n.), ramis strictis simplicibus petiolisque pilis longis subpatentibus hirsutis, stipulis subulatis, pinnis petiolo brevi multoties longioribus, foliolis 20—40-jugis oblique oblongo-linearibus v. lineari-lanceolatis utrinque adpresse pilosis, pedunculis vix capitulo æquilongis fasciculatis infimis axillaribus, bracteolis corollam æquantibus, calycibus longiuscule ciliatis subpappiformibus.—Affinis hinc *M. Goyazensi*, hinc *M. subsericeæ*, a priore differt habitu tenuiore, foliolis capitulisque multo minoribus, petiolis paullo longioribus pedunculis brevioribus—*α. M. subsericea* imprimis pilis caulinis patentibus etc.—Brazil, *Pohl.*

β. tenuis, omnibus partibus minor, gracilior. An species propria? Brazil, *Sello.*

78. M. *stipularis* (Bongard MS.), ramulis longe barbato-hispidis, stipulis latiuscule linearibus striatis, petiolo brevissimo, foliolis 20—30-jugis oblique oblongis obtusiusculis supra breviter strigosis subtus longe sericeo-pilosis, pedunculis capitulo longioribus, inferioribus (plerisque?) axillaribus, bracteolis corolla longioribus, calycibus paleaceis longe ciliato-laceris, legumine margine longe et densissime setoso, valvulis articulatis glabris nudis.—Affinis *M. subsericeæ*, at distincta videtur. Stipulæ sæpe semipollicares.—Chapada; *Langsdorff.*

79. M. *subsericea* (sp. n.), ramulis virgatis appresse stri-

goso-pilosis superne petiolis pedunculis capitulisque longe sericeo-pilosis, stipulis lineari-lanceolatis striatis, petiolo communi brevissimo, foliolis 25—50-jugis oblique lineari-lanceolatis acutiusculis supra minute puberulis subtus longe sericeo-pilosis, capitulis (omnibus?) axillaribus breviter pedunculatis subsessilibusve, bracteolis corolla longioribus, calycibus paleaceis longe ciliato-laceris, leguminis margine longe et densissime setoso, valvulis articulatis glabris nudis.—Strigæ rigidæ, arcte appressæ, superne in pilos sericeos abeunt. Pinnæ angustæ 3—4-pollicares. Foliola 2—3 lin. longa. Leguminis setæ, omnes e margine ortæ, ita longæ et densæ ut legumen totum obtegunt.—Brazil, *Pohl*, *Sello.*

**** *Semistrigosæ.* Foliola rigidula sæpius distincte marginata, supra glabra, subtus per totam superficiem vel ubi a foliolo inferiore non obteguntur setosæ. Legumen (an in omnibus?) articulatum.

80. M. *brevipes* (sp. n.), caule virgato petiolisque piloso-hirtis et pubentibus, stipulis subulatis, petiolo communi subnullo, foliolis 15—20-jugis oblique lanceolato-oblongis acutiusculis supra glabris subtus adpresse pilosis strigosisve, pedunculis plerisque axillaribus folio brevioribus, capitulis parvis, bracteolis corolla brevioribus, calyce obsoleto, legumine undique hispido valvulis articulatis.—Affinis *M. meticulosæ.* Folia numerosa, minora. Foliola pleraque 3 lin. longa, per totam fere superficiem subtus pilosa. Legumen vix 4 lin. longum, biarticulatum.—Rio Pardo; *Langsdorff.*

81. M. *meticolosa* (Mart. Herb. Fl. Bras. 155?) caule virgato subramoso petiolisque dense hirtis pubentibusque, stipulis lineari-subulatis, petiolo communi brevissimo, foliolis 15—20-jugis oblique lanceolato-oblongis acutiusculis supra glabris subtus hinc strigosis, pedunculis inferioribus axillaribus superioribus racemosis capitulo parvo pluries longioribus, bracteolis corolla brevioribus, calyce obsoleto.—Petioli vix lineam longi, v. rarius in foliis infimis subsemipollicares. Pinnæ $1\frac{1}{2}$—2-pollicares. Foliola 3—4 lin. longa. Pedunculi pollicares tenues. Capitula strigis corollarum canescen-

tia, 2½ lin. diametro. Legumen junius undique hispidissimum.—Brazil, *Pohl*, *Sello*.—I am not certain that I am right in referring this plant to Martius' species. His character applies almost equally well to the *M. distans*, which, though allied, appears to me nevertheless to be distinct.

β. ? *fuscescens*, foliolis glabrioribus latioribus 8—10-rarius 12-jugis.—Brazil, *Sello*.—Perhaps a distinct species, but certainly very near the last.

82. M. *distans* (sp. n.), caule virgato v. adscendente basi ramoso petiolisque strigoso-pilosis, stipulis lanceolato-subulatis, pinnis petiolo pluries longioribus, foliolis 20—50-jugis falcato-lanceolatis acutis coriaceis supra glabris subtus strigosis, pedunculis axillaribus folio brevioribus supremis breviter racemosis, bracteolis corollas subæquantibus, calyce minuto, legumine undique breviter setoso valvulis articulatis.—Brazil, *Sello*, *Pohl*, *Langsdorff*, *Claussen*, Goyaz, *Gardner*, *n.* 3135.—It is difficult to draw up a character to distinguish these two species, yet I do not think they can be united. The *M. distans* has fewer leaves than the *M. meticulosa*, longer petioles (half an inch to an inch long), the peduncles generally two or three together, or mostly axillary, the leaflets larger, broader, more rigid and with a thicker margin.

83? M. *axillaris* (sp. n.), ramis divaricatis strigosis incanis, pinnis petiolo pluries longioribus, foliolis 20—40-jugis oblique oblongo-linearibus falcatis supra nitidis subtus strigoso-incanis, pedunculis axillaribus folio subbrevioribus, bracteolis corolla brevioribus, calyce longe ciliato pappiformi.—A very distinct species from the very shining upper surface of the leaves.—Brazil, *Sello*.

***** *Eriocaules*. Frutices ramosi ramis superne sordide v. ferrugineo-lanatis. Folia utrinque pube minutissima cano-glaucescentia et subtus interdum appresse pilosa, rarius glabrata margine tenui ciliolato. Racemi breves. Leguminis valvulæ (an in omnibus?) indivisæ.

84. M. *pogocephala* (sp. n.), ramulis dense lanatis demum scabris, stipulis lanceolatis, petiolo brevissimo, foliolis 12—15-

jugis oblique oblongis subfalcatis obtusis utrinque tenuissime puberulis et subtus adpresse pilosis, capitulis ellipticis ferrugineo-hirsutissimis, bracteolis corolla longioribus, calyce obsoleto.—Pedunculi breves crassi ferrugineo-lanati. Foliola quam in sequentibus majora.—Brazil, *Sello.*

85. M. *erinacea* (sp. n.), ramulis junioribus ferrugineo-lanatis demum glabratis v. scabro-hirtis, stipulis lanceolatis, pinnis petiolo pluries longioribus, foliolis 10—15-jugis late et oblique oblongis subfalcatis obtusis utrinque tenuissime puberulis, capitulis subglobosis ferrugineo hirsutissimis, bracteolis corollam superantibus, calyce obsoleto v. brevissimo, legumine undique breviter et dense aculeato-hispido valvulis indivisis. —Affinis *M. eriocauli*, stipulæ angustiores, capitula hirsutiora, foliola 3—4 lin. longa. Leguminis valvulæ convexiusculæ, margines lati. Semina 3—4, isthmis membranaceis separata.—Brazil, *Sello;* Morro Vermelho, *Langsdorff.*

86. M. *eriocaulis* (sp. n.), ramulis tomentoso-lanatis demum scabris, stipulis lato-lanceolatis, pinnis petiolo pluries longioribus, foliolis 15—20-jugis oblique oblongis subfalcatis obtusiusculis utrinque pube vix conspicua pallidis subglabris junioribus subtus tenuiter strigillosis, capitulis ellipticis pubescentibus, bracteolis corolla subbrevioribus, calyce brevi paleaceo parce laciniato-ciliato.—Stipulæ latiusculæ fere triangulares. Petioli communes subsemipollicares. Pinnæ 2—3-poll.; foliola rigidula, 4—6 lin. longa; venæ obscuræ, margo tenuis. Racemi breves oligocephali. Pedunculi semipollicares v. paullo longiores, sæpius gemini. Capitula fere 5 lin. longa (staminibus neglectis.) Bracteolæ superne appresso-hirtæ nec ut in præcedentibus longe setosæ. Legumen non vidi.—Brazil, *Pohl.*

87. M. *fasciculata* (sp. n.), ramulis dense foliatis junioribus appresse lanatis demum scabro-hirtis, stipulis lato-lanceolatis, petiolo communi subnullo, foliolis 20—30-jugis parvis imbricatis oblongo-linearibus obtusis glabriusculis v. pube subinconspicua pallidis, capitulis subglobosis ferrugineo-hirtis, bracteolis corolla longioribus, calyce minuto breviter ciliato, legumine ovato-oblongo acuto undique hirsutissimo

valvulis indivisis.—Rami virgati. Folia fasciculata, pinnis pollicaribus, foliolis 1—1½-lin. longis rigidulis trinerviis. Pedunculi breves, rigidi. Capitula parva. Legumina 4 lin. longa, 2 lin. lata.

§ 9. *Myriophyllæ.* Frutices suffruticesve, inermes. Pinnæ multijugæ. Foliola parva, multijuga. Capitula racemosa. Legumen breve, valvulis indivisis.

88. M. *myriophylla* (Bongard MS.), ramis petiolis pedunculisque strigoso-villosis, pinnis 12—30-jugis, foliolis 30—60-jugis minimis canescentibus demum glabratis, capitulis subglobosis in racemo longo terminali nudo subsessilibus, bracteolis flore brevioribus, calyce paleaceo 4-partito, legumine undique strigoso-setoso.—Folia iis *M. microcephalæ* et *Calliandrarum microphyllarum*, simillima.—Brazil, *Sello*, *Langsdorff*.

89. M. *micropteris* (sp. n.), ramis petiolis pedunculisque strigis brevibus appressis scabris, pinnis 10—12-jugis, foliolis 15—20-jugis minimis glabris nitidis, capitulis globosis pedunculatis breviter racemosis, bracteolis corolla subdimidio brevioribus, calyce parvo longe ciliato pappiformi, legumine undique strigoso.—Brazil, *Sello*.

§ 10. *Obstrigosæ.* Fruticuli inermes v. sparse aculeati, strigis rigidis in ramis pedunculisque arcte deorsum appressis in petiolis sursum appressis plus minusve hirti. Pinnæ unijugæ. Foliola parva, multijuga. Pedunculi axillares, breves, rarius subracemosi. Capitula globosa. Leguminis valvulæ articulatæ. Species omnes Brasiliæ meridionalis incolæ.

The species of this group may be readily known in the whole genus by the remarkable reflexed strigæ of the branches and peduncles.

90. M. *parvipinna* (sp. n.), inermis, stipulis setaceis, petiolo subnullo, foliolis 19—30-jugis minimis imbricatis linearibus subacutis coriaceis glabris serrulato-ciliatis, pedunculis capitulo globoso brevioribus axillaribus subracemosisve

bracteolis corolla brevioribus, calyce minuto ciliato.—Pinnæ 4—8-lin., foliola vix ½ lin. longa.—Brazil, *Sello.*

91. M. *rupestris* (sp. n.), inermis, stipulis lanceolatis setaceo-acuminatis, petiolo brevissimo, foliolis 20—40-jugis parvis imbricatis oblongo-linearibus subacutis coriaceis glabris ciliatisque, pedunculis axillaribus folio subæquilongis, capitulis globosis, bracteolis corolla brevioribus, calyce minuto ciliato, legumine undique strigoso-setosissimo.—Pinnæ pollicares. Foliola 1—2-lin. longa. Legumina 4—8-articulata. —Brazil, *Sello;* Mountains of Rio Jaquby, *Tweedie.*

92. M. *subinermis* (sp. n.), aculeis paucis rectis v. subnullis, stipulis lanceolato-subulatis, petiolo brevissimo, foliolis 20—30-jugis linearibus acutiusculis coriaceis glabris minute serrulato-ciliatis, pedunculis axillaribus folio brevioribus, capitulis globosis, bracteolis corollam æquantibus?, calyce parvo ciliato.—Vix *M. rupestris* var. major, aculeata.—Brazil, *Sello.*

93. M. *adpressa* (Hook. et Arn.! Bot. Misc. iii. 202.), aculeis paucis sparsis rectis, stipulis lanceolatis, petiolo brevissimo, foliolis 20—30-jugis linearibus obtusiusculis glabris vix ciliolatis, capitulis axillaribus subsessilibus globosis, bracteolis corolla multo brevioribus, calyce obsoleto.—Uraguay, *Baird;* Entre Rios, *Tweedie.*

94. M. *Sprengelii* (DC. Prodr. ii. 430.), aculeis sparsis rectis, petiolo brevi, foliolis 6—8-jugis oblongis acutiusculis margine ciliolatis, capitulis axillaribus subsessilibus globosis, bracteolis corolla multo brevioribus, calyce obsoleto, legumine undique strigoso.—Brazil, *Sello.*

95. M. *ramulosa* (sp. n.), aculeis sparsis rectis, petiolo brevissimo, foliolis 6—8-jugis oblongis acutiusculis margine ciliolatis, pedunculis axillaribus folio sublongioribus, capitulis globosis, bracteolis corolla multo brevioribus, calyce obsoleto, legumine undique strigoso.—*M. Sprengelii* similis, pedunculis exceptis.—Brazil, *Sello.*

96. M. *sparsa* (sp. n.), aculeis sparsis rectis, strigis ramorum raris pedunculorum crebris, pinnis petiolo 2—3-plo longioribus, foliolis 12—20-jugis oblongo-linearibus subglo-

bosis vix ciliatis, pedunculis axillaribus folio longioribus, capitulis globosis, bracteolis corolla multo brevioribus, calyce obsoleto, leguminis valvulis glabris nudis, margine setuloso. —Brazil, *Sello.*

97. M. *glabra* (sp. n.), glaberrima, glauca, aculeis sparsis rectis, strigis ad basin foliorum perpaucis v. nullis, pinnis petiolo subduplo longioribus, foliolis 6—8-jugis oblongo-linearibus obtusiusculis vix serrulato-ciliatis, pedunculis folio parum brevioribus, capitulis globosis, bracteolis corolla multo brevioribus, calyce obsoleto, legumine glabro nudo.—Brazil, *Sello.*

§ 11. *Lepidotæ.* Frutices inermes, plus minusve tomento stellato v. pilis plumosis lepidoti, canescentes v. flavicantes. Pinnæ uni-pluri-jugæ. Foliola multijuga. Capitula globosa v. oblonga v. spicæ cylindricæ, in axillis superioribus pedunculata. Legumina plana uni-pluri-articulata.

The peculiar stellate or plumose down distinguishes this group from all other *Eumimosæ.*

* *Capitulis depresso-globosis involucratis.*

98. M. *involucrata* (sp. n.), ramis petiolisque floccoso-tomentosis pilis basi plumosis intermixtis, stipulis lanceolatis, pinnis unijugis, foliolis 12—15-jugis linearibus utrinque incanis, capitulis depresso-globosis, bracteolis corolla duplo longioribus imbricatis lanceolatis sericeo-lanatis.—Frutex ut videtur procumbens basi radicans ramis floriferis semipedalibus. Petiolus communis brevissimus. Pinnæ 1—1½-pollicares. Folia 2½—3 lin. longa. Capitula cernua 6—8-lin. lata, bracteolis involucrata. Calyx parvus tenuiter ciliatus. Corolla apice sericeo-pilosa, cæterum glabra. Filamenta rigidula, siccitate nigricantia.—Brazil, *Sello.* A most remarkable species, of which the fruit is unknown, but the flowers are those of a true *Mimosa.*

** *Capitulis globosis v. subglobosis non involucratis.*

99. M. *pilulifera*, ramulis petiolisque lepidoto-tomentosis

stipulis setaceis, pinnis unijugis, foliolis 15—30-jugis parvis oblongis v. oblongo-linearibus obtusis utrinque incanis v. supra rarius utrinque viridibus tomento leproso conspersis, capitulis minimis globosis, legumine plano tomentoso nudo 6—8-articulato v. abortu pauciarticulato.—*Acacia Sprengelii*, Hook. et Arn.! Bot. Misc. iii. 209, excl. syn. Spr.—Uraguay, *Tweedie*, *Baird;* Brazil, *Sello*, *Pohl*, *Claussen*, *Langsdorff.*—Near the following, but distinct.

100. M. *incana*, ramulis petiolisque lepidoto-tomentosis incanis, stipulis linearibus, pinnis unijugis, foliolis 15—30-jugis parvis oblongis obtusis utrinque incanis, capitulis parvis globosis, legumine oblongo plano tomentoso dense setoso 1—2-articulato.—*Acacia incana*, Spr.! Syst. iii. 137.—Brazil, *Sello.*

101. M. *Bonplandii*, ramulis petiolisque tomento lepidoto demum evanido conspersis, stipulis subulatis, pinnis 3—4-jugis, foliolis 8—15-jugis parvis oblongis obtusis viridibus v. vix canescentibus, capitulis parvis globosis breviter pedunculatis, bracteolis flore brevioribus.—*Acacia Bonplandii*, Gill.! in Hook. et Arn. Bot. Misc. iii. 205.—Buenos Ayres, *Gillies;* Rio Plata, and Porana, *Tweedie.*

β. *minor.*—*Acacia lepidota*, Hook. et Arn.! l. c.—Uraguay, *Baird.*

102. M. *eriocarpa* (sp. n.), ramulis petiolisque pilis plumosis lepidotisque tomentosis, stipulis subulatis, pinnis 3—4-jugis, foliolis parvis 8—15-jugis oblongis obtusis utrinque stellato-lepidotis, capitulis parvis globosis, legumine uniarticulato plano lana longa plumosa densissime obtecto.—Habitu *M. incanæ* non dissimiles. Legumina pulvina formant ovoidea-globosa, subrufescentia, 3—4-lin. longa.—Brazil, *Sello.*—The pods resemble at first sight some of those deformed pods, becoming thick and hairy, frequently produced among *Mimosas* by the puncture of insects; but in this case the pods and seeds are quite perfect, and all alike, without any trace of the work of insects in those which I have examined.

103. M. *scabrella* (sp. n.), ramis petiolisque incano-tomen-

tosis lepidotis, stipulis obsoletis, pinnis 5—7-jugis, foliolis sub-30-jugis parvis oblongo-linearibus obtusis utrinque incanis, capitulis globosis, legumine plano coriaceo verrucoso-tomentoso.—Habitu et tomento *M. incanæ* affinis sed pinnæ plurijugæ. Flores sæpius 5-meri, interdum (ut in plerisque hujus sectionis) tetrameri, rarissime hexameros vidi.—Brazil, *Sello*.

104. M. *aurivillus* (Mart. Herb. Fl. Bras. 132.), ramulis petiolisque setis basi plumosis tomentoque floccoso ferrugineo dense obtectis, stipulis subulatis, pinnis bijugis foliolis 4—8-jugis ovali-ellipticis oblongisve obtusis crassis utrinque dense stellato-tomentosis, pedunculis folia subsuperantibus, capitulis ovoideo-globosis, bracteolis corollas superantibus, legumine pauciarticulato dense floccoso-et subplumoso-lanato.—Brazil, *Sello;* Minas Geraes, *Martius*. I have not seen Martius's specimen, but his character answers well to Sello's.

105. M. *peduncularis* (Bongard, MS.), ramis petiolisque communibus longe et dense setosis inter setas glabris glaucis, stipulis lanceolatis ciliatis glaucis, pinnis 2—4-jugis, petiolis partialibus floccoso-lanatis, foliolis 6—8-jugis ovali-ellipticis oblongisve utrinque lepidoto-tomentosis subfloccosisve, pedunculis folio longioribus, capitulis parvis subglobosis, bracteolis corollas superantibus, legumine pauciarticulato rufo-tomentoso et plumoso-setoso.—Rami purpurascentes. Foliola fere *M. aurivilli* sed minora.—Brazil, *Sello;* "Cachoeira," *Langsdorff.*

β.? *rufescens*, petiolo communi abbreviato, foliolis majoribus, setis caulinis hinc inde basi subplumosis, tomento raro stellato inter setas et crebriore in stipulis.—Serra da Lapa, *Langsdorff.* Possibly a distinct species, but the flowers and pod are the same. I received it under the MS. name of *M. rufescens*, Bongard.

106. M. *calothamnus* (Mart.! Herb. Fl. Bras. exs. n. 1089), ramulis petiolisque lepidoto-v. floccoso-tomentosis, pinnis 2—3-jugis, foliolis 12—16-jugis ovato-oblongis obtusis supra glabris nitidis subtus albo-tomentosis, stipulis lineari-setaceis, capitulis parvis subglobosis, legumine lepidoto-tomentoso.—Minas Geraes, *Claussen, Sello, Martius.*

*** *Spicis oblongis cylindricisve.*

107. M. *calodendron* (Mart.! l. c. n. 1087), ramulis petiolisque lepidoto-v. floccoso-tomentosis, stipulis abbreviatis demum induratis, pinnis 2—3-jugis, foliolis 8—12-jugis ovatis v. ovato-oblongis obtusissimis supra glabris nitidis subtus albo-tomentosis sublepidotis, spicis oblongis densis.—Minas Geraes, *Langsdorff*, *Sello*, *Martius*.—Spicæ 6—8-lin. longæ.

108. M. *furfuracea* (sp. n.), ramulis petiolisque rufescentibus furfuraceo-tomentosis pilis densissimis stellato-plumosis, pinnis 3—4-jugis, stipulis lanceolato-subulatis, foliolis 10—15-jugis oblique ovatis obtusissimis utrinque lepidoto-tomentosis, spicis oblongo-cylindraceis brevibus densis paniculatis, bracteolis corollam superantibus.—Spicæ pollice breviores.—Brazil, *Sello*.

109. M. *sordida* (sp. n.), ramulis petiolisque tomento sublepidoto rufescentibus, stipulis setaceis, pinnis 3—4-jugis, foliolis 10—15-jugis oblique ovato-oblongis obtusis utrinque stellato-tomentosis subtus rufidis, spicis oblongis parvis densis, bracteolis corolla dimidio brevioribus.—Spicæ vix unquam semipollicares.—Brazil, *Pohl*.

110. M. *daleoides* (sp. n.), ramis petiolisque pilis brevibus plumosis et tomento lepidoto obtectis, pinnis unijugis, foliolis 10—15-jugis oblongis obtusis supra incano-subtus lepidoto-tomentosis, spicis cylindricis gracilibus brevibus, bracteolis corollas subæquantibus.—Brazil, *Sello;* Prov. St Paul, *Langsdorff*.—Spicæ 7—8-lin longæ, interdum basi subinterruptæ.

111. M. *cylindracea* (sp. n.), ramis petiolisque pilis plumosis et tomento lepidoto obtectis, stipulis setaceis, pinnis sub-5-jugis, foliolis 15—20-jugis oblongis obtusis utrinque lepidoto-tomentosis, spicis cylindraceis densis paniculatis, bracteolis corolla brevioribus.—Spicæ pollice paullo longiores.—Brazil, *Pohl*.

I have another species of this group, allied apparently to *M. calothamnus* from Langsdorff's collection, but the specimen is too imperfect to describe.

Sect. II. HABBASIA.—Habbasia et Batocaulon, *DC.*

Flores tetrameri, rarius pentameri v. trimeri. Stamina numero petalorum dupla. Legumen sæpius ultra 6-spermum, rarius 2—4-spermum, valvulis in articulos secedentibus. —Frutices v. arbores, rarius herbæ. Petioli in speciebus perpaucis prope basin et inter v. infra pinnas supremas more *Acaciarum* glanduliferi, in cæteris omnibus eglandulosi, setis tamen inter pinnas (præsertim in *Asperatis*) sæpe elongatis aculeiformibus. Pinnæ plurisæpius multi, rarissime unijugæ. Foliola pauci v. multijuga. Calyx rarius, sæpius minutus v. pappiformis. Corolla gamopetala sæpius membranacea, in *Somniantibus* rigidior profunde fissa et striata. Leguminis margo simplici serie aculeatus v. nudus v. pariter ac valvulæ setosus.—Species pleræque Americanæ, paucæ Africanæ v. Asiaticæ.

§ 1. *Tomentosæ.* Frutices v. arbores inermes ut in *Lepidotis*, plus minusve tomento stellato lepidoti v. canescentes, rarius subglabri. Pinnæ plurijugæ. Foliola multijuga, parva v. angusta. Spicæ elongato-cylindricæ. Legumen inerme. —Species Americanæ.

112. M. *verrucosa* (sp. n.), fruticosa, caule petiolisque verrucoso-lepidotis, pinnis 7—9-jugis, foliolis 10—20-jugis oblique ovatis oblongisve obtusissimis utrinque canescenti-tomentellis subtus in nervis lepidotis, spicis elongatis laxis paniculatis, floribus (omnibus ?) tetrameris.—Frutex 10—12-pedalis, affinis *M. Schomburgkii*, foliolis tomentellis et floribus ut videtur constanter tetrameris distinctus.—Oeiras Prov. Piauhy, *Gardner, n.* 2136; Prov. Bahia, *Blanchet, n.* 2869.

113. M. *Schomburgkii* (Benth. in Hook. Journ. Bot. ii. 133.), arborea, ramulis petiolisque lepidoto-tomentellis, pinnis 7—15-jugis, foliolis 15—20-jugis oblique oblongis obtusis nervo lepidoto-tomentoso excepto glabris supra nitidulis, spicis elongatis laxis paniculatis, floribus pentameris, legumine coriaceo lepidoto-tomentoso.—Pirara, British Guiana, *Schomburgk, n.* 715.

114. M. *pteridifolia* (sp. n.), fruticosa, ramis petiolisque glandulosis et sublepidoto-tomentosis, pinnis 12—18-jugis, foliolis multijugis parvis oblongis obtusis margine revolutis minute puberulis subtus dense glandulosis, spicis subsessilibus elongatis gracilibus paniculatis, floribus tetrameris, legumine villosissimo.—Stipulæ subulatæ, deciduæ. Foliola 1—1½ lin. longa, regulariter disposita. Spicæ solitariæ v. geminæ, 2—3-pollicares. Bracteolæ parvæ, ovatæ. Calyx minutus. Corolla extus puberula et glandulosa. Legumen 8—10-articulatum. Brazil, *Pohl;* Serra Acurua, *Blanchet, n.* 2850; Prov. Goyaz, *Gardner, n.* 4123.

115. M. *discolor* (sp. n.), ramulis petiolisque minutissime cano-tomentellis glabratisve, pinnis 4—5-jugis, foliolis 15—25 jugis oblongo-linearibus obtusis crassiusculis minutissime tomentellis glabrisve, supra pallidis subglaucis, subtus (siccitate) ferrugineis, spicis cylindraceis fasciculato-racemosis, floribus tetrameris.—Stipulæ parvæ, setaceæ. Folia ampla. Pinnæ ultimæ 3—4-pollicares. Foliola maxima semipollicaria, pleraque 4—5 lin. longa. Spicæ sesquipollicares. Corollæ sericeo-puberulæ.—Goyaz, *Gardner, n.* 3787.

§ 2. *Leiocarpæ.* Frutices v. arbores, glabri v. villosi, nec tomentosi, aculeis paucis armati. Pinnæ plurijugæ. Foliola multijuga, parva. Spicæ elongato-cylindricæ. Flores tetrameri. Legumen inerme.—Species Americanæ.

116. M. *leiocarpa* (DC. Prodr. ii. 429.), aculeis paucis sparsis, ramulis petiolisque hispidulis pubescentibusve, pinnis 5—12-jugis, setis inter pinnas brevibus conicis glabris, foliolis multijugis parvis oblongo-linearibus glabris v. ciliato-hispidulis, spicis elongatis laxis paniculatis, legumine lineari tenui, glabro, nitido.—*Acacia malacocentra,* Mart.! Herb. Fl. Bras. 106. —Aculei validi retrorsi in speciminibus nonnullis subnulli. Spicæ 2—3-pollicares. Legumen stipitatum 2—2½ poll. longum, 2—3 lin. latum.—Common near Rio Janeiro; *Martius, Burchell, Guillemin, etc.;* Bahia, *Gardner, n.* 890; Ceara, *Gardner, n.* 1588; Minas Geraes, *Claussen.*

117. M. *acutistipula,* aculeis paucis sparsis, ramulis petio-

lisque puberulis, stipulis lanceolato-subulatis, pinnis 5—6-jugis, setis inter pinnas brevibus conicis villosis, foliolis multijugis oblongo-linearibus obtusis mucronatisve puberulis, spicis cylindraceis brevibus paniculatis, legumine lineari tenui, glabro, nitido.—*Acacia acutistipula*, Mart. Herb. Fl. Bras. 107. ?—Affinis *M. leiocarpæ*. Foliola multo majora (3—4 lin. longa), spicæ dimidio breviores, legumina majora.—Prov. Bahia, *Blanchet*, *n.* 2870; Prov. Piauhy, *Gardner*, *n.* 2135, *Martius*.—I am not quite certain of Martius' synonymy, as he describes his species as unarmed, but where as in this and the preceding species the prickles are so few, many specimens may be met with without any.

118. M. *interrupta* (sp. n.), aculeis oppositis infrastipularibus, ramulis petiolisque pubescentibus, stipulis subulatis, pinnis 6—9-jugis, foliolis multijugis oblongo-linearibus glabriusculis, spicis longis interruptis, floribus tetrameris, ovario villoso.—Rami sulcati. Pubes subviscidula. Aculei validi. Folia ampla, foliolis 3—4-lin. longis supra nitidis. Spicæ subsessiles, semipedales, paniculatæ.—Brazil, *Pohl.*

§ 3. *Cæsalpiniæfoliæ*. Frutices aculeis paucis sparsis v. nullis. Pinnæ paucijugæ. Foliola paucijuga, majuscula, lata. Spicæ cylindricæ. Legumen inerme.—Species Americanæ.

119. M. *cæsalpiniæfolia* (sp. n.), glabriuscula, aculeis uncinatis sparsis paucis v. nullis, pinnis trijugis, foliolis trijugis oblique ovatis obtusissimis membranaceis, spicis paniculatis cylindricis interruptis, floribus (omnibus?) trimeris, legumine lineari glaberrimo lævi.—Aculei in ramulis pauci validi, in petiolis interdum occurrunt etiam parvi. Folia ampla. Foliola exteriora pollicaria, inferiora minora, intimum infimum sæpe deest. Spicæ sesquipollicares. Legumen 2½—3 poll. longum, 4—5 lin. latum.—Prov. Piauhy, *Gardner*, *n.* 2137.

120. M. *sericantha* (sp. n.), inermis? ramis petiolis foliolisque subtus canescenti-puberulis, pinnis trijugis inæqualibus ultimarum foliolis 6—8-jugis oblique obovatis obtusissimis,

spicis gracilibus paniculatis, floribus sericeis plerisque tetrameris, legumine lineari canescenti-puberulo.—Foliola majora pollicaria, inferiora multo minora. Spicæ subinterruptæ, 2—3 pollicares. Legumen 2—3-pollicare, 3—4 lin. latum.—Prov. Pernambuco, *Gardner*, n. 2833.

§ 4. *Glanduliferæ.* Frutices (scandentes?). Aculei parvi, retrorsi, in ramulis petiolisque. Pinnæ pauci-v.-plurijugæ. Glandula prope basin petioli, infra pinnas superiores, et infra foliola superiora v. omnia. Foliola lata. Capitula parva, globosa. Legumen margine aculeatum v. inerme.

121. M. *micracantha* (Benth. in Hook. Journ. Bot. ii. 131), ramulis minute ferrugineo-puberulis, aculeis minimis raris, pinnis 2—3-jugis distantibus, glandulis petiolorum depressis, foliolis subbijugis amplis oblique ovatis obovatisve obtusis coriaceis supra nitidis subtus minute ferrugineo-punctatis ad venas subpubentibus, paniculis amplis ramosis, capitulis parvis breviter pedunculatis, floribus pentameris, legumine lato lineari pluriarticulato glabro nitido inermi.—Foliola sæpe 3 poll. longa, 2 poll. lata.—Rio Negro, *Langsdorff*, *Schomburgk.*

This and the two following species are very remarkable, as being the only ones in the whole genus with glandular petioles. Their habit is not unlike that of some *Pithecolobia.* The flowers appear to me to be those of a *Mimosa.* I have seen but one pod apparently ripe in which the valves in each article adhere closely together, as in *Entada,* instead of separating spontaneously as in most *Mimosæ.* If this character should prove constant in the three species, they may perhaps be considered as a distinct genus, and if so, possibly my *Entada? myriadinia* above referred to may be associated with them. *Acacia Guilandinae?* DC. Prodr. ii. 465, of which the number of stamina is not stated, appears from the short character to be near *M. micracantha.*

122. M. *extensa* (sp. n.), glabra, aculeis minimis, pinnis 2—3-jugis distantibus, glandulis petiolorum depressis, foliolis unijugis amplis ovato-falcatis dimidiatis acuminatis nitidis,

racemis axillaribus terminalibusque simplicibus ramosisve polycephalis, pedunculis fasciculatis, capitulis parvis, floribus plerisque tetrameris.—Brazil, *Sello*, a single specimen, near *M. micracantha*, but evidently distinct.

123. M. *trinervis* (Desf.—DC. Prodr. ii. 430.), glabra, aculeis sparsis, pinnis 3—4-jugis, foliolis 4—5-jugis ovali-rhombeis mucronulatis basi trinerviis venosis.—Habitat unknown.—I have not seen the plant, but if a *Mimosa*, it must belong to this group.

124. M. *paniculata* (Benth. in Hook. Journ. Bot. ii. 131.), ramulis petiolis pedunculisque pubescentibus, aculeis parvis retrorsis numerosis, pinnis 5—7-jugis, glandulis petiolorum conicis, foliolis 7—11-jugis oblique falcato-rhombeis mucronulatis supra lucidis hirtellis subtus pubescentibus, panicula terminali ampla, capitulis parvis, floribus tetrameris.—Foliola 4—5-lin. longa.—British Guiana, *Schomburgk*.

§ 5. *Rubicaules.* Frutices sæpe scandentes v. arbores. Aculei sparsi. Pinnæ et foliola plurijuga. Glandulæ petiolares nullæ. Capitula globosa, sæpius paniculata. Bracteolæ parvæ. Legumen planum, glabrum v. pubescens nec setosum, margine retrorsum aculeato v. nudo, articulis sæpius 6—8 subquadratis.

* *Americanæ.*

125. M. *obovata* (sp. n.), glabra, aculeis in caule petiolisque paucis validis retrorsis, pinnis 3—4-jugis, foliolis 1—2-jugis oblique obovatis obtusissimis, panicula terminali ramosa, legumine stipitato lato-lineari glabro nudo.—Foliola majora sesquipollicaria, siccitate fuscescentia, subtus ferruginea. Panicula brevis, ramis paucis. Flores nonnisi marcidos vidi. Legumen 2—3 poll. longum, 6 lin. latum, 5—8-articulatum.—Brazil, *Pohl.*

126. M. *Ceratonia* (Linn.! Spec. 1508.), glaberrima, repens v. scandens, aculeis in caule petiolis pedunculisque parvis retrorsis copiosis, pinnis 3—5-jugis, foliolis trijugis oblique obovatis orbiculatisve obtusissimis, racemo terminali

vix ramoso, floribus trimeris, legumine sessili lato-lineari glabro margine retrorsum aculeato.—Isle of St Thomas, *Ehrenberg;* St Lucia, *Anderson.*

127? M. *montana* (Kunth. Mim. t. 10.) fruticosa, ramis aculeatis puberulis, petiolis inermibus, pinnis 2—3-jugis, foliolis 4—6-jugis elliptico-oblongis obtusis puberulis parvis, capitulis axillaribus pedunculatis, legumine lineari glabro nudo.—Andes of Peru, *Humboldt and Bonpland.*—Not having seen the plant, I have drawn up the above character from Kunth's description.

128. M. *sepiaria* (sp. n.), fruticosa v. arborea, ramulis petiolis paniculaque pubescentibus glabratisve, aculeis paucis sparsis rectiusculis validis, pinnis 4—8-jugis, foliolis 20—40-jugis linearibus obliquis subnitidis glabris v. raro puberulis, panicula ampla polycephala laxa, floribus tetrameris, legumine breviter stipitato lineari glabro nitido nudo.—Species in sepibus fruticosa, in sylvis arbor pulcherrima. Foliola crebra, subfalcata, 3—4 lin. longa. Panicula ter quaterve ramosa. Flores albi. Legumen 2 poll. longum, 3 lin. latum, articulis 6—8 quadratis.—Common in hedges all over South Brazil to Rio Janeiro, *Tweedie, Sello, Lord Colchester, Guillemin, Pohl, etc.;* Bahia, *Salzmann;* Pernambuco, *Gardner, n.* 979.—I feel persuaded, that so common a Brazilian species must be already described under some other name, yet I cannot find any published character to agree with it.

129. M. *oligacantha* (DC. Prod. ii. 429.) from St Martha. Unknown to me, but apparently near *M. obovata.*

** *Asiaticæ.*

130. M. *rubicaulis* (Lam. Dict. i. 20.) fruticosa, subscandens, aculeis in caule petiolisque sparsis, ramulis foliisque junioribus pubescentibus tomentosisve, pinnis 3—10-jugis, foliolis 6—15-jugis oblique oblongis v. oblongo-linearibus obtusis subtus v. utrinque adpresso-puberulis, pedunculis axillaribus ad apices ramorum racemosis, floribus tetrameris, calyce corolla 4—5-plo breviore, legumine stipitato lato, lineari falcato gla-

bro, margine aculeato v. nudo.—*M. octandra* et *M. mutabilis*, Roxb. Fl. Ind. ii. 564.—A very variable species, common in East India, from whence it is sent in almost all collections, (Wallich. Cat. n. 5289), assuming very different forms, but all probably belonging to one species.

131. M. *hamata* (Willd. Spec. iv. 1033.), fruticosa, aculeis in caule petiolisque validis sparsis, ramulis foliis pedunculisque cano-puberulis, pinnis 3—4-jugis, foliolis 6—10-jugis oblique oblongis v. oblongo-linearibus parvis, pedunculis plerisque axillaribus, floribus tetrameris, calyce corolla pluries breviore, legumine stipitato lato-lineari falcato pubescente, margine aculeato.—East Indian-Peninsula, *Heyne*, *Russel*, *Wight*. (Wallich. Cat. n. 5290.) Very near *M. rubicaulis*, and only differs from the prickly fruited forms of that species by its smaller leaves, and more copious canescent down on the foliage, and especially on the pods.

132. M. *latispinosa* (Lam. Dict. i. 22.), fruticosa, subscandens, aculeis in ramulis raris in petiolis crebrioribus basi sæpe latissimis, ramulis petiolis paniculisque tomentoso-pubescentibus, pinnis 10—25-jugis, foliolis 10—20-jugis oblique oblongis obtusissimis utrinque adpresse puberulis, panicula ampla polycephala, capitulis parvis, calyce corolla dimidio breviore, legumine stipitato lato-lineari subfalcato puberulo, margine aculeolato v. nudo.—*M. Mascarensis*, Spr. Syst. ii. 207?—Madagascar, *Bojer*; Mauritius, *Telfair*, (Wallich. Cat. n. 5291.)

133? M. *Emirnensis* (sp. n.), fruticosa? inermis? ramulis petiolis paniculaque minute tomentoso-puberulis, pinnis 6—10-jugis, foliolis 5—8-jugis oblique oblongis obtusiusculis utrinque adpresse puberulis, panicula ramosa polycephala, legumine sessili lato-lineari puberulo inermi. Folia fere *M. rubicaulis*, cætera *M. latispinosæ*, ab utraque differt legumine sessili.—Prov. Emirna in Madagascar, *Bojer*.—I have only seen a single specimen, with pods not quite ripe.

§ 6, *Somniantes*. Frutices v. herbæ, aculeatæ v. inermes. Pinnæ plurijugæ. Setæ inter pinnas breves stipuliformes.

Foliola multijuga parva. Capitula parva globosa, axillaria v. racemosa. Calyx minutus. Corollæ laciniæ multistriatæ. Legumina linearia, angusta, pluri-v multiarticulata, inermia, glabra v. sæpius plus minusve setoso-v. glanduloso-hispida, articulis latitudine sæpius longioribus. —Species Americanæ.

* *Aculeatæ. Pedunculi filiformes et capitula glabra.*

134. M. *acutiflora* (sp. n.), ramis petiolisque aculeolatis dense rufo-hispidis eglandulosis, stipulis lanceolato-subulatis, pinnis 4—6-jugis, foliolis multijugis imbricatis linearibus obtusis glabris v. vix ciliolatis, bracteolis parvis, corollis acutis, legumine longe stipitato multiarticulato undique dense setoso et glanduloso-hispido.—Brazil, *Pohl.*

135. M. *podocarpa* (sp. n.), ramis petiolisque aculeolatis viscoso-pubescentibus et glanduloso-hirtis, stipulis lanceolato-subulatis, pinnis 5—10-jugis, foliolis multijugis imbricatis linearibus obtusis glabris v. vix ciliolatis, bracteolis parvis, corollis obtusissimis, legumine longe stipitato multiarticulato undique parce glanduloso-hispido.—Brazil, *Pohl, Sello.*

136. M. *somnians* (Humb. et Bonpl. in Willd. Spec. iv. 1036.), ramis petiolisque aculeatis glabris v. hispidulis, stipulis ovato-lanceolatis setaceo-acuminatis, pinnis subquadrijugis, foliolis multijugis linearibus acutiusculis glabris, bracteolis parvis, legumine stipitato multiarticulato hispidulo.—New Granada, *Humboldt and Bonpland.*

137. M. *somniculosa* (Humb. et Kunth. Nov. Gen. et Sp. vi. 257.) ramis petiolisque aculeatis pilosis, stipulis lanceolato-subulatis, pinnis 10—12-jugis, foliolis multijugis linearibus acutiusculis glabris v. vix ciliolatis, bracteolis parvis.—Tropical America, *Humboldt and Bonpland.*

The four preceding species (of which the two latter are only known to me by Kunth's description,) are very near to each other, aud may possibly be marked varieties of one species; yet the two which I have described appear to me sufficiently distinct, and neither of them agree entirely with the characters of either of Humboldt's.—I have not added *M.*

palpitans (Humb. et Bonpl.), because Kunth says he knows not how to distinguish it from *M. somnians*.

138. M. *quadrijuga* (Salzmann, MS.), suffruticosa? glaberrima, v. pilis glanduliferis hinc inde conspersa, aculeis sparsis, stipulis lanceolato-setaceis, pinnis 2—4-jugis, foliolis multijugis linearibus obtusis, bracteis parvis, legumine longe stipitato multiarticulato glabro.—Brazil, *Sello;* Bahia, *Salzmann*.—This again is near the preceding ones, but much more slender, and the pod, as well as the rest of the plant, almost entirely smooth.

139. M. *bijuga* (sp. n.), herbacea, subinermis, glabra v. pilis brevibus patentibus paucisque glanduliferis conspersa et hinc inde minutissime aculeolata, stipulis ovato-lanceolatis acuminatis, pinnis bijugis, foliolis multijugis linearibus obtusis, capitulis ovato-globosis, bracteolis lato-ovatis corollas æquantibus.—Foliola quam in præcedentibus paullo majora (2—4 lin. longa) et habitus rigidior.—Piauhy, *Gardner, n.* 2133.

** *Inermes.*

140. M. *leptocaulis* (sp. n.), herbacea v. suffruticosa? glaberrima v. pilis glanduliferis strigisque raris, stipulis lanceolatis setaceo-acuminatis, pinnis 1—2-jugis, foliolis multijugis linearibus obtusis, pedunculis glabris filiformibus, bracteolis corolla glabra multo brevioribus.—Ramuli gracillimi. Petioli communes 1—1½-pollicares, filiformes. Pinnæ pollicares. Foliola vix 2 lin. longa.—Brazil, *Pohl.*

141. M. *trijuga* (sp. n.), herbacea v. suffruticosa, glaberrima v. pilis glanduliferis strigisve conspersa, stipulis lanceolatis setaceo-acuminatis, pinnis 3-rarius 4-jugis, foliolis multijugis linearibus obtusis, pedunculis glabris filiformibus, bracteolis corolla glabra multo brevioribus.—*M. leptocauli* affinis, sed omnibus partibus major et pinnæ constanter numerosiores.—Brazil, *Pohl.*

142. M. *viscida* (Willd. Enum. Hort. Berol. 1048?) fruticosa?, ramulis petiolisque glanduloso-viscosis, stipulis lanceolatis, pinnis 3—4-jugis, foliolis multijugis, pedunculis glabris filiformibus linearibus obtusis glabris, bracteolis

corolla glabra multo brevioribus.—Præcedentibus affinis sed caules et petioli glandulis stipitatis subsessilibusve obtecti. Pinnæ sesquipollicares.—Rio Pardo, *Langsdorff.*

143. M. *lupulina* (sp. n.), fruticosa, ramis petiolisque breviter et dense rufo-hirtis, stipulis lato-lanceolatis, pinnis 6—10-jugis, foliolis multijugis linearibus obtusis glabris, pedunculis rufo-hirtis, bracteolis ovato-hirtis corollas glabras superantibus, legumine sessili lineari subfalcato pluriarticulato undique hirsutissimo.—Brazil, *Pohl.*

144. M. *lasiocarpa* (sp. n.), suffruticosa? ramis petiolis pedunculisque dense rufo-hirtis et pubentibus, stipulis lanceolatis, pinnis 4—8-jugis, foliolis multijugis linearibus obtusis piloso-pubescentibus, bracteolis brevibus, corollis pubescentibus, legumine lineari 8—12-articulato undique ferrugineo-hirto et pubente.—Habitus præcedentium. Pili densi rufi.—Brazil, *Sello, Pohl, Claussen.*

§ 7. *Asperatæ.* Frutices (v. herbæ?). Aculei retrorsi, in caule petiolisque sparsi, sæpe validi. Pinnæ pluri, v. multijugæ. Setæ inter pinnas subulatæ, nunc aculeiformes. Foliola pluri-v. multijuga. Pedunculi axillares, superiores racemosi. Capitula globosa v. elliptica. Corolla membranacea, non striata. Legumina linearia, multiarticulata, undique glanduloso-strigosa v. setoso-hirta, nunc hispidissima.

* *Glandulosæ, legumine anguste lineari acuto, setis inter pinnas parvis.*

145. M. *adenocarpa* (sp. n.), fruticosa, glanduloso-hirta, stipulis setaceis, pinnis 6—10-jugis, foliolis 10—20-jugis linearibus hinc inde ciliatis et pilis glanduliferis conspersis glabrisque, capitulis globosis, bracteolis parvis, calyce brevi nudo, legumine subsessili anguste lineari rostrato glanduloso-viscoso.—Folia 3-pollicaria v. paullo longiora. Pinnæ sæpius distantes, semipollicares. Setulæ inter pinnas parvæ, rarius 1—3 lin. longæ. Foliola 1½—2 lin. longa. Legumina pollicaria, articulis 4—6-latitudine longioribus, Brazil, *Pohl, Sello, Claussen, Langsdorff.*

146. M. *paludosa* (sp. n.), fruticosa, setis longis hispida et glanduloso-hirta pube canescenti intermixta, stipulis lanceolatis setaceo-acuminatis, pinnis 6—15-jugis, foliolis 20—40-jugis linearibus obtusis ciliatis hispidulisque, capitulis globosis, bracteolis corolla parum brevioribus setosis v. hinc inde elongato-comosis, calyce parvo truncato, legumine sessili latiuscule lineari-falcato acuminato viscoso-pubescente.—Habitu *M. asperatæ* affinis videtur sed undique glanduloso-hirta. Leguminis articuli 8—15, longitudine parum latiora.—Brazil, *Langsdorff, Claussen ;* Piauhy, *Gardner, n.* 1942.

** *Eglandulosæ, legumine latiore obtusiusculo multiarticulato. Setæ inter pinnas sæpius aculeiformes, elongatæ.*

147. M. *asperata* (Linn. Spec. 1507.) fruticosa, ramis petiolis pedunculisque patentim v. subappresse setoso-hispidis, stipulis ovato-lanceolatis subulato-acuminatis, pinnis 8—15-jugis, foliolis multijugis linearibus supra glabris margine ciliatis subtus appresse pubescentibus hirtisve, pedunculis folio multo brevioribus, capitulis globosis, calycibus longiuscule laciniato-ciliatis, leguminibus undique setoso-hispidissimis, articulis latitudine multo brevioribus.—South America: W. Indies, Demerara, *Parker ;* Porto Bello, *Billberg ;* Lima, *Cuming, n.* 988 ; Brazil, *Sello ;* Tropical and S. Brazil, *Tweedie ;* Minas Geraes, *Claussen ;* Bahia, *Salzmann ;* Pernambuco, *Gardner, n.* 983 ; Piauhy, *Gardner, n.* 1585 ; Africa: Senegal, *Sieber, n.* 46 ; Egypt, *Kotschy,* 940 ; Syene, *Sieber ;* Mauritius, *Telfar, etc.*—As far as descriptions go, this species appears to include, besides the *M. polyacantha,* Willd., which is certainly not different ; the *M. canescens, M. hispida, M. ciliata,* and *M. pellita,* Willd., *M. sicaria,* Hoffm., all inserted with more or less of doubt in De Candolle's Prodromus, and *M. procumbens,* Schum. Pl. Guin. 324. The hairs of the stem are patent or appressed in both African and American specimens.

148. M. *elliptica* (sp. n.), fruticosa, ramis petiolisque sparse setoso-hispidis, stipulis lato-lanceolatis, pinnis 7—10-jugis, foliolis multijugis linearibus glabris v. vix pilosulis

margine ciliatis, pedunculis foliolo vix dimidio brevioribus, capitulis oblongo-ellipticis, calycibus abbreviatis vix ciliatis, leguminibus hirsutissimis multiarticulatis.—Affinis *M. asperatæ.* Habitus laxior. Aculei pauci. Foliola rigidiora. Pedunculi 2—3-pollicares. Flores fere glabri, in capitulo duplo longiore quam lato dispositi. Legumen junius tantum vidi. Tota planta siccitate nigrescit.—Rio Janeiro, *Lhotsky, Burchell, Pohl, Sello, Gardner.*

149. M. *cinerea* (Vell. Fl. Flum. xi. t. 35? non Linn.), fruticosa, procumbens, ramis pedunculisque appresse strigoso-pilosis, stipulis ovato-lanceolatis, pinnis 6—10-jugis foliolis 20—30-jugis linearibus ciliatis nudisve, pedunculis folio brevioribus, capitulis globosis, calyce minuto, legumine sparse strigoso articulis 4—10 latitudine parum brevioribus.—Much of the habit of some of the less hairy forms of *M. asperata*, but the strigæ are much closer appressed and more rigid, and the pod is very different, both as to the setæ which are few and appressed, not erect, and the articles which are nearly as long as broad. Velloso's figure shows the setæ between the pinnæ rather longer than I have seen them, but appears to be the plant before me. The polyandrous flower is surely a mistake; for the setæ, above-mentioned, are characteristic of *Mimosa.*—Entre Rios, Maldonado, La Plata, etc., *Tweedie;* Minas Geraes, *Claussen ?* (whose specimens are not in fruit.)

§ 8. *Microcephalæ.* (cfr. char. in diagnosi specifica.)

150. M. *microcephala* (Humb. et Bonpl. in Willd. Spec. iv. 1039.; Kunth. Mim. 23. t. 8.), fruticosa, inermis, ramis adpresso-hispidulis, stipulis lanceolatis subulato-acuminatis, pinnis 20—30-jugis, foliolis 20—30-jugis, minimis oblongo-linearibus glabris ciliolatis nudisve, racemis gracilibus aphyllis subramosis polycephalis, capitulis minimis breviter pedunculatis globosis ellipticisve, calyce minuto, legumine lineari multiarticulato undique strigoso-piloso.—On the Orinoco, *Humboldt and Bonpland ;* Parime Mountains, *Schomburgk.*

§ 9. *Dormientes.* Herbæ fruticesve decumbentes v. prostrati. Aculei sparsi nunc rari subnulli. Folia fere *Asperatarum*. Pedunculi axillares. Capitula globosa v. elliptica. Legumen obovatum v. oblongum, 1—3-articulatum, undique setosum v. hispidum.

151. M. *dormiens* (Humb. et Bonpl. in Willd. Spec. iv. 1035.), fruticosa, procumbens, ramis petiolisque adpresse albido-hirsutis et aculeis rectis armatis, stipulis ovatis acuminatis, pinnis 5-rarius 6-jugis, foliolis 9—18-jugis linearibus acutiusculis utrinque puberulis, pedunculis petiolo communi dimidio brevioribus, bracteolis corollam superantibus ciliato-setosis, calyce minuto, legumine oblique obovato-oblongo 1—3-articulato undique hispido.—Santarem, *Langsdorff*. On the river Apures, *Humboldt and Bonpland*, (whose specimens I have not seen.)

152. M. *intermedia* (Kunth. Mim. 16. t. 6.), fruticosa procumbens, ramis petiolisque hispidis et aculeis rectis armatis, stipulis ovatis acutis, pinnis 4—7-jugis, foliolis 9—15-jugis linearibus obtusis glabris, pedunculis petiolo communi triplo brevioribus, bracteolis corollas æquantibus, calyce subnullo, legumine oblique obovato-oblongo 1—2-articulato undique hispido.—Plain of Caraccas, *Humboldt and Bonpland*.

153. M. *humilis* (Humb. et Bonp. in Willd. Spec. iv. 1037.), fruticosa, procumbens, ramis petiolisque adpresse hispidis et pubentibus, aculeis rectis, stipulis ovatis acutis, pinnis 3—4-jugis, foliolis 6—12-jugis linearibus acutiusculis subtus margineque puberulis, pedunculis petiolo communi subdimidio brevioribus, legumine oblique obovato biarticulato undique hispido.—Cumana, *Humboldt and Bonpland*.—The characters of this and the preceding species are taken from Kunth's description. Both are said to be very near *M. dormiens*.

154. M. *strigillosa* (Torr. et Gr.! Fl. N. Amer. i. 399.), prostrata, aculeis parvis raris v. nullis, ramulis junioribus petiolis pedunculisque strigoso-setosis v. demum nudis, stipulis ovatis cordatisve, pinnis 4—6-jugis, foliolis 10—15-jugis, lineari-oblongis ciliatis nudisve subglabris, pedunculis petiolo

communi subæquilongis, capitulis ellipticis, bracteolis corolla parum brevioribus, calyce minuto, legumine ovato v. oblongo 1—3-articulato undique setoso.—East Florida and Louisiana, *Torrey and Gray;* Texas, *Berlandier*, *Drummond*, 3d coll., n. 157, 157, bis., and 159.

155. M. *camporum* (Benth. in Hook. Journ. Bot. ii. 130.), procumbens, aculeis minutis raris, caule petiolisque hispidis demum glabriusculis scabris, stipulis lanceolatis acuminatis, pinnis 2—4-jugis, foliolis 10—30-jugis linearibus ciliatis glabriusculis, capitulis parvis breviter pedunculatis subracemosis, bracteolis corollam subæquantibus, calyce parvo, legumine oblongo 1—3-articulato vix obliquo undique hispido.—British Guiana, *Schomburgk*, *n.* 725.

Sect. III. AMERIA.

Flores tetrameri v. sæpe pentameri. Stamina numero petalorum dupla. Legumen pleiospermum v. polyspermum, intus transverse septatum v. uniloculare, valvulis planis v. convexis, indivisis.—Frutices, arbores v. rarius herbæ. Petioli glandulis orbati et rarius inter pinnas setosi. Pinnæ pluri-v. multijugæ, rarius unijugæ aut nullæ. Foliola sæpius multijuga. Calyx varius. Corolla membranacea. Legumen nunc undique setosissimum, v. hispidum nunc glabrum nudum v. margine aculeatum.—Species omnes Americanæ.

§ 1. *Antrorsæ*. (cfr. char. in diagnosi specifica.)

156. M. *antrorsæ* (sp. n.), fruticosa? ramulis crassis tetragonis petiolis pedunculisque adpresse rufo-pilosis, aculeis in angulis caulis et hinc inde in petiolis antrorsum uncinatis, pinnis 10—15-jugis, foliolis 30—50-jugis parvis linearibus ciliatis utrinque glabris v. subtus puberulis, racemo terminali, capitulis globosis, bracteolis corolla brevioribus, calyce parvo ciliato, legumine lato lineari plano undique adpresse villoso polyspermo.—Pili totius plantæ flavicantes v. rufi. Stipulæ lineari-subulatæ. Folia semipedalia. Foliola 1½—2½-lin. longa. Racemus pedalis basi foliatus, pedunculis vix pollicaribus geminis ternisve. Flores tetrameri. Legumen

2—2½-pollicare. Valvulæ inter semina transverse lineata at non (tanquam e speciminibus apparet) in articulos sponte secedentia.—Brazil, *Pohl.* This species, with some resemblance in habit to the *Asperatæ*, and to the *Pachycarpæ*, is nevertheless easily distinguished by a variety of characters.

§ 2. *Pachycarpæ.* Frutices inermes plus minusve setosi. Stipulæ angustæ. Pinnæ pluri-sæpius multijugæ. Setæ inter pinnas obsoletæ. Foliola multijuga coriacea nitentia sæpius ciliato-setoso rarius pube obtecta. Racemi terminales, nudi v. basi foliati, nunc paniculato-ramosi, nunc brevissimi oligocephali. Capitula subglobosa sæpius majuscula. Bracteolæ setoso-ciliatæ. Legumina sæpius brevia polysperma undique setosa v. muricato-hispida, valvulis plano-convexis crassiusculis subcarnosisve.

The pod is known but in three or four species, but the whole group have so distinct a habitus, that it is probably much the same in the other species.

157. M. *nitens* (sp. n.), setis sparsis patentibus, pinnis 2—3-jugis, foliolis late linearibus obliquis hinc auriculato-truncatis glabris minute ciliatis, panicula laxa aphylla, capitulis hispidis, bracteolis corollas superantibus.—Foliola arcte approximata 6—9 lin. longa, 2 lin. lata, plurinervia. Stamina fere pollicaria.—Brazil, *Pohl.*

158. M. *vernicosa* (Bongard MS.), setis strigosis brevibus raris, pinnis 4—6-jugis, foliolis linearibus obtusis glabris nudis, racemo oligocephalo foliis breviore, bracteolis corollam æquantibus, calyce minuto nudo. Foliola 3—4-lin. longa. —Serra da Lapa, *Langsdorff.*

159. M. *leiocephala* (sp. n.), setis strigosis sparsis, pinnis 10—15-jugis, foliolis linearibus obtusis glabris subciliatis, racemis paniculato-ramosis laxis polycephalis, capitulis glabris, bracteolis corolla brevioribus calyceque minuto nudis.—Goyaz, *Gardner, n.* 3706.—Foliola numerosa, 2-lin. longa.

160. M. *setosa* (sp. n.), setis longis rufis, pube brevissima intermixta, pinnis 15—35-jugis, foliolis linearibus ciliatis glabriusculis, racemo elongato polycephalo subramoso, capi-

tulis hispidis pedunculatis, bracteolis corollas superantibus, calyce minuto longiuscule ciliato.—Foliola *M. leiocephalæ* v. interdum leviter puberula. Folia sæpe pedalia. Capitula (staminibus neglectis) circa 4-lin. diametro.—Brazil, *Pohl.*

161. M. *Gardneri* (sp. n.), setis longis rufis densissimis, ramulis crassis, pinnis 20—30-jugis, foliolis linearibus setoso-ciliatis glabriusculis, racemo elongato polycephalo, capitulis breviter pedunculatis hispidissimis, bracteolis corollas æquantibus, calyce minuto longiuscule ciliato.—Folia præcedentis hispidiora, racemus demum sesquipedalis. Capitula duplo majora quam in *M. setosa.*—Brazil, *Pohl;* Goyaz, *Gardner, n.* 2136.

162. M. *Clausseni* (sp. n.), setis longis crassis reflexis rufis densissimis, ramulis crassis, pinnis 15—20-jugis, foliolis oblique linearibus acutiusculis ciliatis subglabris, racemo abbreviato polycephalo, capitulis glomeratis pedunculatis ovato-globosis maximis hispidissimis, bracteolis corollas æquantibus, calyce minuto longiuscule ciliato, legumine oblongo undique setoso-hispidissimo.—Folia fere præcedentium, foliola majora. Capitula staminibus neglectis pollicem longa. —Minas Geraes, *Claussen;* Brazil, *Pohl.*

163. M. *pycnocoma* (sp. n.), setis densis basi crassis retrorsis apice longe piliferis suberectis, ramulis crassis, foliis sub racemo condensatis, pinnis 12—18-jugis, foliolis linearibus ciliatis glabris, racemo foliis breviore denso polycephalo, capitulis pilosissimis, bracteolis corollas æquantibus, calyce parvo longe ciliato.—Folia semipedalia cæterum fere *M. setosæ,* v. *M. Gardneri.*—Capitula semipollicem diametro.—Brazil, *Pohl.*

164. M. *densa* (sp. n.), setis brevibus appressis strigosis densis junioribus piliferis, pinnis 20—35-jugis, foliolis parvis oblongo-linearibus utrinque adpresse pubescentibus v. demum glabriusculis, racemis brevibus, capitulis villosis, bracteolis corolla brevioribus, calyce minuto ciliato.—*M. foliolosæ* affinis sed ramulis crassis apice dense foliatis, racemis folio brevioribus et hirsutie *M. pycnocomæ* approximatur. Foliola 1-lin. longa, imbricata.—Brazil, *Pohl.*

165. M. *foliolosa* (sp. n.), pilis tenuibus patentibus subferrugineis pube brevi pilisque glanduliferis intermixtis, pinnis 20—35-jugis, foliolis parvis oblongis obtusis utrinque pubescentibus, racemo folia superante, capitulis hirsutis, bracteolis corolla brevioribus, calyce minuto ciliato.—Ramuli tenuiores quam in præcedentibus. Pili basi non incrassati. Pubes foliolorum brevis, patens. Pinnæ rarius pollicem longæ. Foliola numerosa imbricata 1-lin. longa. Capitula 3—4-lin. longa. Corollæ villosæ.—Brazil, *Pohl.*

β. pubescens, pilis ferrugineis raris.—Brazil, *Pohl.*

166. M. *platyloma* (sp. n.), pilis patentibus rufis densis, pinnis 10—16-jugis, foliolis parvis oblongo-linearibus obtusis supra glabris subtus hirsutis ciliatis, racemo abbreviato, capitulis hirsutis ?, bracteolis setosissimis corollas æquantibus ?, calyce minuto ciliato, legumine oblongo crasso undique ferrugineo-hirto, margine latissimo.—Brazil, *Sello.*—Perhaps a variety of *M. foliolosa*, but as far as I can judge from the specimens in flower in the one case, in fruit only with a few old withered flowers in the other, the two appear to me to be distinct.

167. M. *pachycarpa* (sp. n.), caule petiolisque pube ferruginea scabris, setis subnullis, pinnis 10—20-jugis linearibus obtusis glabris nudis, pedunculis axillaribus folio brevioribus (superioribus racemosis ?), legumine oblongo crasso undique verrucoso, margine lato.—Brazil, *Sello.*—Near to *M. vernicosa* on the one hand, and to *M. platyloma* on the other. I have only seen it in fruit.

§ 3. *Stipellares.* Frutices divaricato-ramosi, glabri v. canescenti-pubescentes nec setosi, sparse aculeati v. rarius inermes. Pinnæ pauci-rarius multijugæ. Stipellæ ad basin petiolorum minimæ orbiculatæ, nec ut in cæteris *Mimosis* setaceæ vel setaceo-acuminatæ. Pedunculi axillares. Capitula globosa. Flores tetrameri. Calyces parvi non ciliati. Legumen planum, glabrum pubescens v. tuberculatum, nec setosum nec aculeatum, margine cartilagineo.

168. M. *bifurca* (sp. n.), glaberrima, inermis, nitida, ramis angulatis dichotomis, pinnis 2—3-jugis, foliolis 20—30-jugis alternis oblique ovatis crassiusculis, pedunculis folio brevioribus bracteolis parvis, legumine lineari glabro lævi.—Species distinctissima. Pinnæ distantes 2½—3½-pollicares. Stipellæ fere glandulæformes. Foliola 1—2-lin. longa.—Brazil, *Sello.*

169. M. *intricata* (sp. n.), glabra v. pube minutissima subcanescens, aculeis sparsis uncinatis, stipulis minutis, pinnis 4—6-jugis, foliolis 8—15-jugis minimis obovatis, pedunculis petiolo communi sublongioribus, bracteolis minimis.—Fruticulus ramosissimus, aculeis numerosis. Foliola vix semilineam longa. Capitula 2—2½-lin. diametro.—Brazil, *Sello.*

170. M. *lucidula* (sp. n.), glabra, inermis, stipulis lanceolatis acutissimis, pinnis 3—5-jugis, foliolis 8—12-jugis parvis oblongis v. oblongo-linearibus, pedunculis petiolo communi sublongioribus, bracteolis minimis.—Near *M. intricata*, and *M. cruenta*, but evidently distinct from both. Leaflets 1 line long, shining.—Brazil, *Sello.* Described from a wild specimen without flowers, and a cultivated one in flower, from the Royal Garden, Berlin.

171. M. *Uruguayensis* (Hook. et Arn.! Bot. Misc. iii. 202.), glabra, aculeis sparsis rectis, stipulis lato-ovatis acutis, pinnis 1—2-jugis, foliolis 8—12-jugis oblongo-linearibus, pedunculis folio sublongioribus, bracteolis parvis, legumine lineari falcato scabro.—Uruguay, *Baird*, Sello.

172. M. *cruenta* (sp. n.), inermis v. aculeis sparsis subrecurvis armata, ramulis pedunculis foliisque junioribus pube minuta canescentibus, stipulis ovato-lanceolatis subulato-acuminatis, pinnis 1—3-jugis, rarissime 4—5-jugis, foliolis 6—8-jugis oblongis obtusissimis, pedunculis folio sublongioribus, bracteolis corolla brevioribus, legumine lineari-falcato canescenti-puberulo.—Species a *M. Uruguayensi* pube præsertim distincta. Stipella interior sæpe deest et hoc casu exterior major quam solito evadit. Foliola latiora crassiora, flores paullo majores quam in *M. Uruguayensi.* Capitula (filamenta?) teste Tweedio cruenta sunt.—Brazil, Sello; Maldonado, *Tweedie.*

173. M. *trachycarpa* (sp. n.), aculeis sparsis recurvis, ramis

foliisque tenuiter glanduloso-tomentellis, stipulis brevibus ovatis acutis, pinnis 3—4-jugis, foliolis 6—12-jugis parvis oblongis obtusis crassiusculis, pedunculis folio longioribus, bracteolis corolla brevioribus, legumine lineari-falcato obtuso inermi undique breviter echinato-scabro.—*M. cruentæ* affinis.—Brazil, *Sello.*

174. M. *bracteolaris* (sp. n.), inermis, ramulis pedunculis foliisque junioribus pube molli canescentibus, stipulis lanceolato-subulatis, pinnis 1—2-jugis, foliolis 3—5-jugis oblique oblongis obtusiusculis, pedunculis folio sublongioribus, bracteolis subulatis corolla subduplo longioribus.—Habitus *M. cruentæ*, pube et bracteolis distincta.—Brazil, *Sello.*

§ 4. *Acanthocarpæ.* Frutices ramosissimi, ramulis sæpius tortuosis, glabri pubescentes v. villosi, nec setosi, inermes v. sæpius aculeis infrastipularibus sparsisve armati. Stipulæ et stipellæ parvæ, setaceæ. Pinnæ pauci-rarius multijugæ. Pedunculi axillares. Capitula globosa v. rarius cylindraceo-spicæformia. Flores tetrameri v. sæpius pentameri. Calyx obtuse dentatus nec ciliatus. Legumen planum sæpius falcatum, glabrum v. pubescens, margine nudo v. (ut in *Rubicaulibus*) uncinato-aculeato, nec setoso.

175. M. *Bahamensis* (sp. n.), aculeis sparsis recurvis raris, ramis petiolis pedunculisque dense ferrugineo-tomentosis, pinnis 2—4-jugis, foliolis 3—6-jugis obovato-oblongis ellipticisve glabris v. pube minuta conspersis, capitulis globosis, floribus tetrameris, calycibus dimidium corollæ æquantibus.—Species pube ferruginea insignis. Foliola 1—1½-lin. longa.—Bahamas, *Herb. Hooker.*

176. M. *mollis* (sp. n.), inermis v. aculeis minutis infrastipularibus, molliter rufo-villosa, pinnis 4—5-jugis, foliolis 6—10-jugis oblongis acutiusculis utrinque villosis, capitulis globosis, bracteolis corolla brevioribus, floribus pentameris, calyce corolla pluries brevior.—Mexico, (Acatlan), *Andrieux, n.* 400.

177. M. *Quitensis* (sp. n.), minute puberula, aculeis sparsis rectis incurvisque, pinnis 6—12-jugis, foliolis 12—20-

jugis minimis linearibus acutis, pedunculis folio brevioribus, capitulis globosis, bracteolis minutis, floribus pentameris, calyce corolla subquadruplo breviore, legumine falcato glabro inermi.—Foliola ½—1 lin. longa. Capitula *M. acanthocarpæ.* —Ravines round Quito, *Hall.*

178. M. *domingensis*, glabriuscula, aculeis caulinis infrastipularibus geminis recurvis parvis v. nullis, petiolaribus sparsis, pinnis 3—5-jugis, foliolis 6—8-jugis oblongo-linearibus obtusis, pedunculis folio brevioribus, capitulis globosis ellipticisive, bracteolis minutis, floribus 4—5-meris, calycibus corolla triplo brevioribus, legumine lineari-falcato glabro inermi.—*Acacia domingensis.* Bert.! in DC. Prodr. ii. 464.—Very near *M. acanthocarpa.*—St Domingo, *Bertero.*

179. M? *revoluta*,—*Acacia revoluta*, Kunth. Mim. 84. t. 26., as well as *Acacia uncinella*, Poit, or *Acacia acanthocarpa β.* DC., is said to differ from the *M. acanthocarpa* by the presence of a petiolar gland, which I have never seen in any *Mimosa*, except the few species forming the fourth group of *Habbasia.*

180. M. *acanthocarpa*, minute cano-puberula, aculeis caulinis infrastipularibus geminis recurvis, petiolaribus sparsis, pinnis 8—15-jugis rarius paucijugis, foliolis 6—10-jugis oblongo-linearibus, pedunculis folio brevioribus, capitulis globosis, bracteolis minutis, floribus pentameris, calycibus corolla glabriuscula vix dimidio brevioribus, legumine lineari-falcato puberulo, margine aculeato.—Mexico, *G. J. Graham*, *Berlandier, n.* 661. etc.—*Acacia acanthocarpa*, Willd., DC. Prodr. ii. 463.

181. M. *biuncifera* (Benth. Pl. Hartw. 12.), puberula, aculeis caulinis infrastipularibus geminis recurvis, petiolaribus minutis raris v. nullis, pinnis 4—6-jugis, foliolis 10—15-jugis parvis oblongo-linearibus, pedunculis folio subbrevioribus, capitulis globosis, bracteolis minutis, floribus 4—5-meris, calycibus corolla tomentosa vix dimidio brevioribus.—Perhaps too near to *M. acanthocarpa*, but looks different.—Mexico, *Hartweg, n.* 69.—*Andrieux's n.* 399, from Chalco,

a very bad specimen—may be a mere downy form of this plant.

182. M. *monancistra* (Benth. l. c.), incana, aculeis infrafoliaceis solitariis subrecurvis, petiolis inermibus, pinnis 2—4-jugis, foliolis 5—6-jugis parvis oblongis, pedunculis capitulo globoso v. elliptico longioribus, bracteolis minutis, calyce corollæ dimidium vix æquante, floribus pentameris.—Mexico, *Hartweg, n.* 70.

183. M. *depauperata* (Benth. l. c. 13.), ramis glabriusculis, aculeis infrafoliaceis solitariis recurvis, foliis cano, puberulis inermibus, pinnis 1—2-jugis, foliolis 2—3-jugis parvis ovato-orbiculatis, pedunculis capitulo globoso subbrevioribus, bracteolis minutis, floribus pentameris, calyce corolla dimidio breviore.—Mexico, *G. J. Graham.*

184. M. *polyantha* (sp. n.), cano-pubescens, aculeis infrafoliaceis solitariis recurvis, petiolis inermibus, pinnis 2-jugis, foliolis 5—6-jugis oblongis, spicis cylindraceis subinterruptis pedunculo longioribus, bracteolis minutis, floribus 4—5-meris, calyce corolla triplo breviore.—Spicæ pollicem longæ. Habitus fere *M. monancistræ.*—Mexico, *Andrieux, n.* 397.

Acacia prosopoides, DC. Prodr. ii. 460., described from one of Moçino and Sessé's Mexican drawings, may be the *M. polyantha;* besides which, *Acacia caduca*, Humb. et Bonpl., and *A. fasciculata*, Kunth., are probably *Mimosæ* belonging to this section.

§ 5. *Pedunculosæ.* Frutices suffruticesve diffusi, inermes, glabri v. pilosi, nec setosi. Stipulæ basi sæpius cordato-dilatatæ. Stipellæ minutæ, setaceæ v. setaceo-acuminatæ. Pinnæ pauci-v. plurijugæ. Pedunculi axillares v. superiores racemosi, folio longiores. Capitula globosa. Bracteolæ parvæ. Calyx minutus, rarius ciliatus. Legumen planum, glabrum v. pubescens, inerme.

185. M. *brachycarpa* (sp. n.), fruticosa strigoso-hispida, stipulis lato-lanceolatis, pinnis 4—6-jugis, foliolis multijugis linearibus obtusis, bracteolis ovato-lanceolatis corollas supe-

rantibus, corollis striatis, legumine obovato-oblongo hispido 2—4-spermo, valvulis membranaceis indivisis.—Habitus, folia et flores *Somniantium* sed leguminis valvulæ omnino integræ.—Serra da Lapa, *Langsdorff.*

186. M. *implexa* (sp. n.), fruticosa, ramosissima, glabra v. glanduloso-scabra, stipulis stipellisque ovatis acutis, pinnis unijugis, petiolo communi brevissimo, foliolis 4—7-jugis oblongo-linearibus crassiusculis 2—3-nerviis, pedunculis folio duplo longioribus.—Affinis hinc *M. lucidulæ*, hinc sequentibus. —Brazil, *Sello.*

187. M. *cordistipula* (sp. n.), fruticosa, caule pedunculisque molliter pubescentibus, foliis glanduloso-pubescentibus, pinnis 3—5-jugis, foliolis 10—15-jugis numerosis oblongis obtusis, pedunculis folio multo longioribus, calycibus bracteolisque ciliatis.—Petioli vetusti interdum persistunt et fere spinescunt. Foliola densa, 1 lin. longa.—Serra Jacobina, *Blanchet, n.* 2597.

188. M. *misera* (sp. n.), suffruticosa, ramis foliisque patentim pilosis hirtisve, pinnis 2—4-jugis, foliolis 4—8-jugis obovato-oblongis obtusis, pedunculis folio duplo longioribus.—An imperfect specimen, allied on the one hand to *M. cordistipula*, on the other to *M. leptantha.*—Piauhy, *Gardner, n.* 2133.

189. M. *leptantha* (sp. n.), fruticosa, ramis foliisque patentim pilosulis, et in parte superiore glanduloso-puberulis, stipulis inferioribus cordatis, superioribus subulatis, pinnis 2—4-jugis, foliolis 3—5-jugis minimis oblongis obtusis, pedunculis folio subduplo longioribus, floribus trimeris, legumine lineari-falcato glabro.—Ramuli tenuissimi, ultimi uti petioli et pedunculi filiformes. Petioli communes 6—12 lin. longi. Pinnæ 2—4 lin. longæ. Capitula parva.—Avacaty, *Gardner, n.* 1586.

190? M. *gracilis* (sp. n.), suffruticosa, procumbens, glabra v. pilosula, pinnis parvis distantibus 6—10-jugis foliolis 4—6-jugis minimis obovato-oblongis, capitulis parvis, pedunculo folio breviore, legumine lineari pubescente.—Species evidenter præcedentibus sequentibusque affinis, sed a charactere *Pedunculatarum* differt pedunculis brevibus, a *Paucifoliatis* petiolis magis foliatis tenuioribus.—Brazil, *Sello, Pohl, Claussen.*

§ 6. *Paucifoliatæ.* Suffrutices inermes glabri. Petioli communes longi rigiduli v. phyllodinei, pinnis foliolisque paucis parvis v. nullis. Capitula et flores præcedentium.

191. M. *paucifolia* (sp. n.), ramis petiolisque tenuibus glaberrimis, pinnis parvis 2—3-jugis, foliolis minimis subbijugis obovatis.—Suffrutex ramosissimus, gracilis, semipedalis. Petioli communes 2—4-pollicares, rigidi, filiformes, apice setiformes, partiales setiformes, 1—2-lin. longi, in apice petioli communes oppositi. Stipulæ et stipellæ setaceæ. Foliola ad apicem petioli partialis pleraque vix 1 lin. longa, interdum in foliis infimis tamen multo majora. Pedunculi filiformes. Capitula iis *M. Phyllodineæ* similia.—Brazil, *Pohl.*

192. M. *phyllodinea* (sp. n.), suffruticosa, glaberrima, petiolis phyllodineis anguste linearibus apice mucronatis aphyllis v. pinnis foliolisque minimis unijugis instructis.—Caules angulati 1—1½-pedales. Phyllodia iis *Acaciarum* Australasicarum similia, verticaliter compressa, 3—5-poll. longa, 1—2-lin. lata, rigida, plurinervia, apice obtusa et superata nunc mucrone simplici (petioli seta terminali) nunc mucronibus 3 (petiolibus 2 partialibus setaque terminali), quorum unus alterve interdum brevissime bifidus est et rarius foliola fert duo minima, obovato-oblonga, mucronulata. Pedunculi subpollicares. Capitula 3 lin. diametro, glaberrima. Bracteolæ parvæ, subulatæ. Calyx vix conspicuus. Corolla 4-fida. Stamina corolla subtriplo longiora, basi monadelpha. Ovarium breviter stipitatum, glabrum.—Brazil, *Pohl.*

§ 7. *Ephedroideæ.* Fruticuli ramulis spinescentibus foliis minimis v. nullis. Capitula globosa. Flores 4—5-meri. Legumina linearia plana inermia glabra v. pubescentia nec setosa.

193. M. *Gilliesii*, ramulis striatis puberulis demum glabratis apice spinescentibus, stipulis parvis spinescentibus deciduis, foliis raris, petiolo communi brevissimo, pinnis unijugis, foliolis parvis 2—4-jugis, capitulis breviter pedunculatis, legumine lineari pubescente polyspermo.—*Prosopis globosa*, Gill.! in Hook. Bot. Misc. iii. 205.—Mendoza, *Gillies*; Patagonia, *Tweedie*.

194. M. *ephedroides*, ramulis striatis glabris apice spinescentibus aphyllis, capitulis sessilibus, legumine (ex margine persistente) lineari glabro.—*Prosopis? ephedroides*, Gill.! l. c.—Prov. S. Luis, *Gillies*.

Among the *Mimosæ* retained in the genus by De Candolle, there remains *M. pistaciæfolia*, Willd., which, if a true *Mimosa*, which is doubtful, would belong to the *Glanduliferæ*, and *M. geminata*, so imperfectly known, that it can only be enumerated amongst puzzles at the end of the genus. Among the doubtful species enumerated in the Prodromus, *M. staminea*, Billb., is probably a *Calliandra*, *M. cochliocarpa* is *Pithecolobium Abaremotemo*, Mart., and the remainder have either already been referred to their genera since the publication of the Prodromus, or are entirely doubtful. *M. adhærens* (Mart. Herb. Fl. Bras. 122.) is an *Acacia*. *M. hirta*, Vell. Fl. Flum. 11. t. 31., is certainly a *Mimosa*; but not having seen any specimen that agrees with the figure, I am unable to guess even to which section it belongs.

XVII. SCHRANCKIA, Willd.

Flores superiores v. plerique hermaphroditi, 5-meri rarius 4-meri, inferiores sæpe abortu masculi. Calyx membranaceus, brevis, nunc minimus. Corolla gamopetala, membranacea. Stamina numero petalorum æqualia v. dupla. Antheræ parvæ, suborbiculatæ. Legumen anguste lineare, valvulis 2 indivisis a margine persistente secedentibus et eo latioribus v. æquilatis, undique echinatum, intus polyspermum, epulposum, uniloculare.—Herbæ prostratæ v. frutices subscandentes. Aculei in angulis ramorum petiolis pedunculisque numerosi recurvi. Folia bipinnata, eglandulosa, sensitiva. Stipulæ stipellæque setaceæ. Petioli inter pinnas sæpius setiferi. Foliola parva. Pedunculi axillares v. vix racemosi, solitarii v. gemini. Flores capitati v. spicati, rosei v. purpurascentes. Filamenta in floribus masculis sæpe complanata.

This genus only differs from *Mimosa* in habit, and in the narrowness of the valves of the pod, compared to the breadth of the border; and, were the genus not already established, I should have merely proposed it as a section of *Mimosa*, or as two subsections of *Ameria*. The *Mimosa gracilis* has much of the habit of a *Schranckia*, with the exception of the prickles.

Sect. 1. RHODOSTACHYA.

Flores pentameri, pentandri, spicati.

1. S. *macrostachya* (sp. n.), fruticosa, ramulis 4—5-gonis petiolisque molliter pubescentibus, pinnis 14—20-jugis, foliolis multijugis anguste linearibus utrinque puberulis glabratisve.—Affinis *S. rhodostachyæ.* Foliola minora, numerosiora, angustiora. Spicæ longiores, densiores. Filamenta interdum pilosula. Ovarium jam defloratum et paullo auctum villosissimum est.—Brazil, *Pohl, Sello; Martius,* exs. n. 1103.

2. S. *rhodostachya* (sp. n.), fruticosa, ramulis angulato-striatis petiolisque pubescentibus, pinnis 5—8-jugis, foliolis multijugis linearibus utrinque puberulis v. demum glabratis.—Aculei parvi uncinati. Petioli communes 2—2½-pollicares; pinnæ pollicares; foliola 1½—2-lin. longa, venis vix conspicuis. Stipellæ longiusculæ. Setæ inter pinnas nunc setaceæ, nunc oblongæ v. nullæ. Spicæ brevissime pedunculatæ, 2—3-poll. longæ. Bracteolæ minutæ. Flores sessiles, rosei. Calyx ¼ lin. Corolla 1 lin. longa. Stamina corolla 4—5-plo longiora. Ovarium subsessile, oblongum. Legumen junius tantum et vix auctum vidi, villosum est et uncinato-aculeatum.—Serra Acurua, *Blanchet, n.* 2912; Avacaty, *Gardner, n.* 1587.

I regret not having seen any ripe fruit of the two preceding species, but when very young it is precisely that of other *Schranckiæ.*

Sect. II. EUSCHRANCKIA.

Flores pentameri rarius tetrameri, subdecandri rarius octandri, globoso-capitati.

3. S. *brachycarpa* (Benth. in Hook. Journ. Bot. ii. 130.), caule 4—5-gono piloso, pinnis 4—8-jugis, foliolis multijugis obscure venosis, pedunculo vix capitulo longiore, legumine tenui brevi.—*Schranchia sp. nova?* Schlecht. Linnæa. *Mimosa invisa*, Mart.! Herb. Fl. Bras. 121.—Xalapa, *Galeotti;* Rio Negro, *Schomburgk;* Minas Geraes, *Claussen;* Goyaz, *Gardner, n.* 3704; Rio Janeiro and Minas, *Martius, n.* 172; Brazil, *Pohl, Selló.*

4. S. *Selloi* (sp. n.), glabra, caule obscure 4—5-gono, pinnis 2—3-jugis, foliolis 10—20-jugis obscure venosis, pedunculo capitulo 2—3-plo longiore, legumine compresso margine dense aculeato valvulis subnudis.—*S. leptocarpæ* simillima, sed anguli caulis minus prominentes et legumen (quod immaturum tantum vidi) latius et magis compressum videtur quam in cæteris speciebus.—Brazil, *Sello.*

5. S. *leptocarpa* (DC. Prodr. ii. 443.), glabra, caule acute 4—5-gono, pinnis 2—3-jugis, foliolis 10—20-jugis obscure venosis, pedunculo vix capitulo longiore, legumine tenui longe acuminato undique dense aculeato.—Rio Negro, *Schomburgk;* Bahia, *Salzmann;* Brazil, *Pohl, Sello.*

6. S. *aculeata* (Willd. Spec. iv. 1041.), glaberrima, caule 4—5-gono, pinnis 2—3-jugis, foliolis 8—15-jugis obscure venosis, pedunculo folio v. legumine paullo breviore, legumine acuto v. breviter acuminato undique dense aculeato.—Vera Cruz, *Schiede.*

7. S. *uncinata* (Willd. Spec. iv. 1043.), glaberrima, caule angulato-striato, pinnis 4—6-jugis, foliolis subtus venosis, pedunculo folio v. legumine sublongiore, legumine acuto v. breviter acuminato undique dense aculeato.—*Leptoglottis Nuttallii*, DC. Leg. Mem. 451.—Arkansas, *Nuttall;* Texas, *Drummond,* 3d coll. 159. bis et ter, (some specimens only,) 2d col. n. 67.: *Berlandier, n.* 1605.

8. S. *angustata* (Torr. et Gr.! Fl. N. Amer. i. 400.),

glaberrima, caule angulato-striato, pinnis 4—6-jugis, foliolis subtus subaveniis, pedunculis folio v. legumine multo breviore, legumine tenui subulato-acuminato, aculeis brevibus sparsis.—A species usually confounded with *S. uncinata*, but well distinguished by the authors of the above quoted excellent North American Flora.—Southern United States and Texas, *Drummond*, 2d coll. 71. bis, and 3d coll. 159. bis, (some specimens.)

S. *hamata* (Humb. et Bonpl. in Willd. Spec. iv. 1042.), appears to differ from *S. leptocarpa*, in the number of pinnæ which are four pair, whereas I have never seen more than three pair in *S. leptocarpa.*—*S. distachya* (DC. Prodr. ii. 443.), is another of those puzzles created by the publication of descriptions taken from Moçino and Sessé's drawings.

XVIII. LEUCÆNA, *gen. nov.*

Calyx tubuloso-campanulatus, 5-dentatus. Petala 5 libera, membranacea, basi angustata. Stamina 10. Antheræ ovato-oblongæ v. subglobosæ, sæpe pilosæ. Legumen stipitatum, lato lineare, plano-compressum, valvulis 2 rigide membranaceis dehiscens, intus uniloculare, seminibus numerosis transversis.—Arbores v. frutices Americæ tropicæ, inermes. Folia bipinnata, petiolo sæpius infra jugum infimum pinnarum glandula majuscula interdum evanida onusto. Pedunculi axillares, subfasciculati, folio multo breviores, apice v. infra apicem bibracteati. Capitula globosa. Flores albi. Genus a *Piptadeniis Niopis*, quibus habitu affine est, differt calyce majore, petalis tenuibus, antheris non glanduliferis, legumine lævi, etc.

1. L. *glauca*, pinnis 4—8-jugis, foliolis 10—20 jugis distantibus lineari-falcatis membranaceis subtus pallidis glaucisve, bracteolis apice ovatis calycem subæquantibus, calyce corolla dimidio breviore.—*Acacia glauca*, Willd., *A. biceps*, Willd., *A. frondosa*, Willd., et *A. leucocephala*, Link. DC. Prodr. ii. 467, 468. West Indies, Bahamas, and Demerara; Brazil, *Sello*, *Gardner*, *n.* 891; Lima, *Cuming*, n. 990; gardens of S. Europe and N. Africa; E. India, Ceylon, Mauritius, Java and China,

(Wall. Cat. n. 5239.) Probably introduced into Asia, and Africa.

2. L. *pulverulenta*, pinnis 15—18-jugis, foliolis multijugis parvis lineari-falcatis obtusiusculis, calyce corolla quadruplo breviore, antheris glabris.—*Acacia pulverulenta*, Schlecht. ! Linnæa 12. 571.—Hot region of Mexico, *Schiede*, *Berlandier*, 2 n. 288. = 2288

3. L. *diversifolia*, pinnis 4—17-jugis, foliolis multijugis parvis lineari-falcatis approximatis nitidis subcoriaceis, calyce corolla dimidio breviore, antheris pilosulis.—*Acacia diversifolia*, Schlecht.! Linnæa 12. 571.—*A. trichandra*, Zucc. Pl. Nov. fasc. 2. 41.—Near Jalapa, *Schiede*.

4. L. *trichodes*, pinnis 2—3-jugis, foliolis 2—5-jugis ovatis, calyce corolla parum breviore, antheris pilosis.—*Acacia trichodes*, Willd. et *A.*; *pseudotrichodes*, DC. Prodr. ii. 466.—W. Indies, Caraccas and Peru, *Mathews*, n. 476, *Cuming*, n. 985, etc.

The above are all the species I am acquainted with; but it is possible some other decandrous *Acaciæ* of authors may be referrible to the genus, which is easily known either in flower or in fruit.

XIX. XYLIA, *gen. nov.*

Calyx, Corolla et Stamina fere *Leucænæ*. Legumen sessile, oblongo-falcatum, compressum, utrinque angustatum lignosum, intus inter semina septatum, seminibus transversis funiculo crasso carnoso brevi affixis.

Sp. *unica*; *X. dolabriformis*, Arbor elata, inermis, glabra v. in partibus junioribus tomentoso-puberula. Stipulæ parvæ. Folia bipinnata, pinnis unijugis. Glandula elevata, nunc obscura, inter pinnas. Foliola 2—6-juga extima sæpe semipedalia, inferiora multo minora, penninervia, supra glabra nitida, subtus minute puberula v. glabra. Pedunculi fasciculati, axillares v. subracemosi, 2—3-pollicares. Capitula globosa, tomentosa, magnitudine fere *Leucænæ glaucæ*, floribus dense imbricatis pallide virescentibus. Calycis dentes calloso-incrassati. Corolla calyce paullo longior, omnino *Leucænæ*.

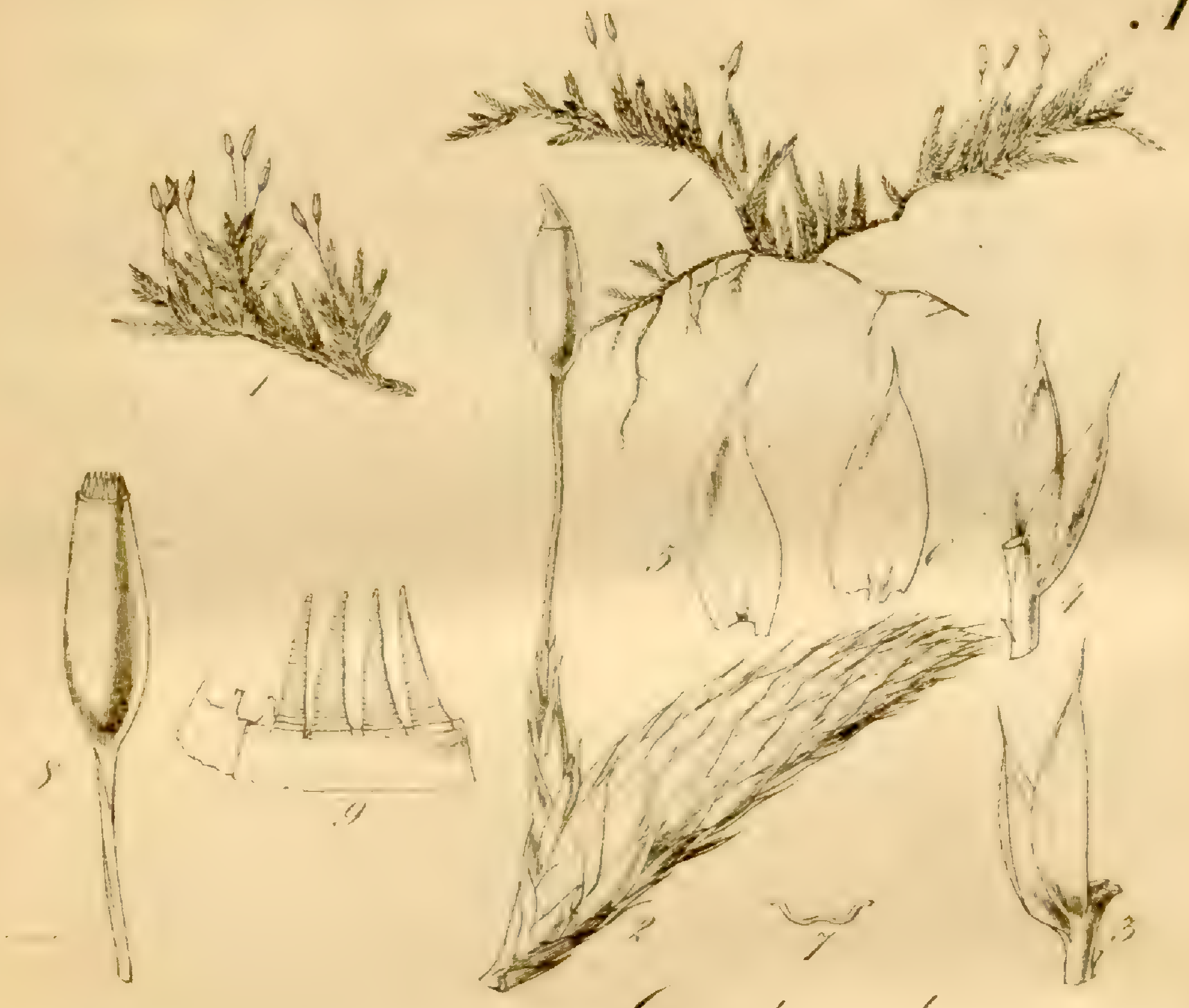
Legumen 4—5-poll. longum, medio 1½—2-poll. latum.—*Mimosa xylocarpa*, Roxb. Pl. Corom. 1. t. 100. (*Acacia*, Willd.; *Inga*, DC.) Wall. Cat. n. 5277.—*Inga lignosa*, Grah. in Wall. Cat. n. 5278.—*Inga dolabriformis*, Grah. in Wall. Cat. n. 5279.—*Mimosa Acle*, Blanco, Fl. Filip. 738.—Various parts of India, *Roxburgh;* Attran and Singapore, *Wallich;* Philippine Islands, *Blanco.* Both Roxburgh and Father Blanco describe the wood as very hard and valuable.

XV.—*On a new* LAURUS (*subgen.* Oreodaphne?) *from Southern Africa.*

[TAB. XXIII.]

THE *Laurus* here represented has been long cultivated in the greenhouse of the Royal Botanic Garden of Kew, having been introduced from the Cape of Good Hope by Mr Bowie, under the name of the "*African Oak,* or *African Teak.*" That the plant is a native of the vicinity of the Cape seems very improbable: the *Laurus* (Ceramophora) *bullata* being the only species, so far as I know, which has been found at the extreme southern extremity of that vast continent: nor did Mr Bowie's travels extend so much to the northward, as to render it probable that he should have fallen in with the true " African Oak" which inhabits the interior of Sierra Leone. The impression at the Botanic Garden has been, that it was a cultivated plant at the Cape, and that it was given to Mr Bowie as the real African Oak, of which nothing has hitherto been known to Europeans but the commercial value of the timber. Lately indeed, in the chink of a trunk of some African Oak in our dock-yards, a leaf has been found, supposed to belong to this wood, and which has been pronounced to be that of some Laurineous Plant. It is this coincidence of circumstances which has induced me to direct attention to this plant of our Botanic Garden; for it otherwise possesses little to recommend it, and the fruit is altogether unknown to me. It has been suggested that the name of African *Oak* may have

Laurus Borii.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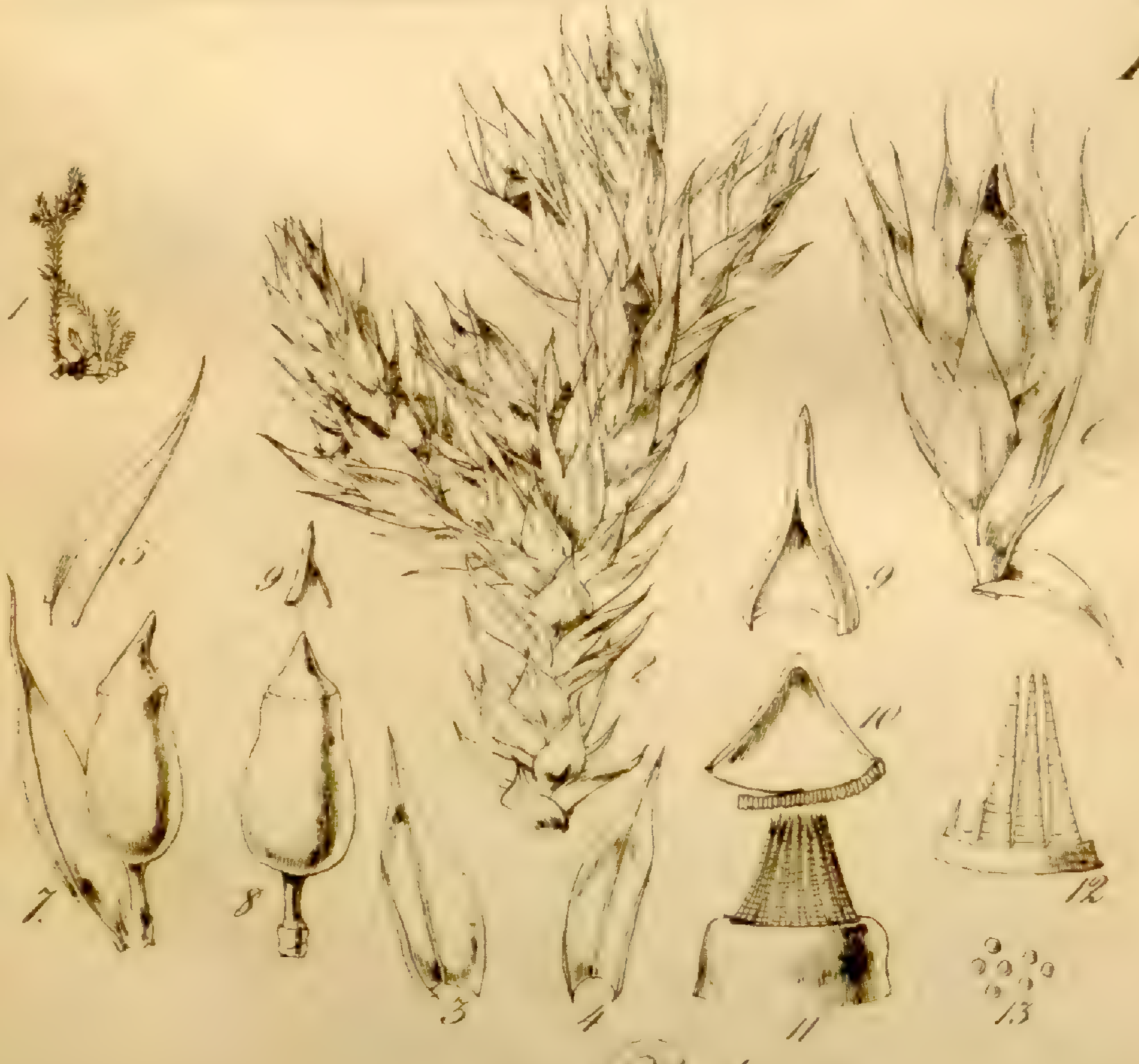
Neckera breviseta.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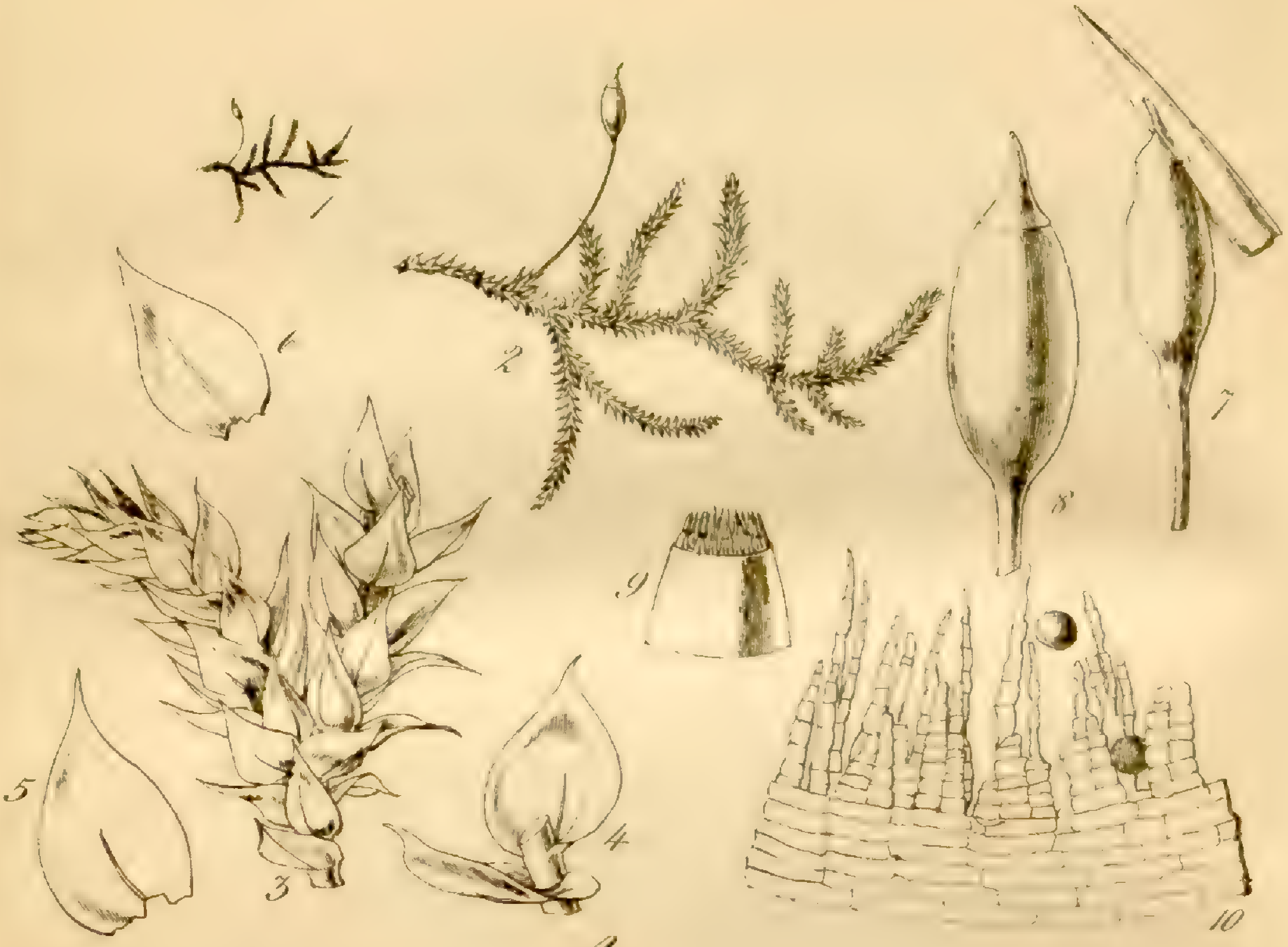
Daltonia nervosa.

Allan & Ferguson lith Glasgow

A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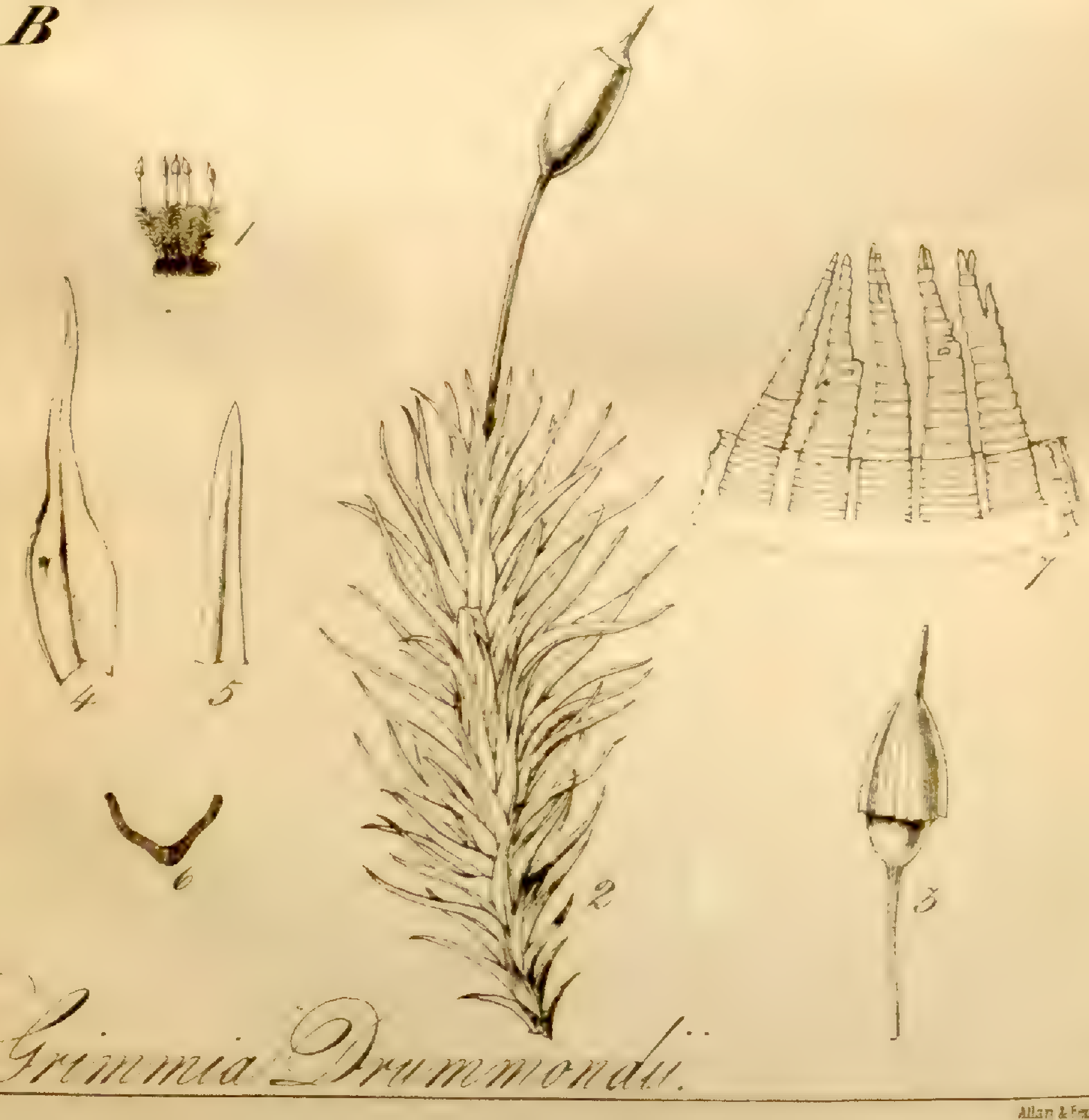
Clasmatodon pusillus.

B



Grimmia Drummondii.

Allan & Ferguson lith. Glasgow

been given to the timber in question from the resemblance of the fruit (of *Laurus*) to that of the acorn. The species I should designate as

Laurus (Oreodaphne ?) *Bowiei ;* glabra hermaphrodita, ramis teretibus lævibus, foliis coriaceo-ellipticis triplinerviis brevi-petiolatis basi apiceque acutis, racemis axillaribus folio brevioribus, pedicellis bracteatis, bracteis foliaceis, staminibus 9 biserialibus quorum 3 ext. glandulis geminis munitis, filamentis brevibus, antheris bilocularibus.

Our plant is from 3—4 feet high, branched, with nearly erect branches, rounded, smooth, clothed with dark-brown bark. Leaves alternate, 2—2½ inches long, on very short thick petioles, almost sessile above, dark-green, obscurely nerved; below pale, the costæ prominent, and branching near the base into 3, the lateral branches running parallel to the margin, and disappearing below the apex. Racemes solitary in the axils of the leaves, and shorter than they. Pedicels bracteated, the bracteas leafy, triple-nerved. Perianth turbinate, six-cleft, jointed on the top of the pedicel. Fertile stamens 9 : of the 6 outer, 3 have large fleshy glands, one on each side. Germen ovate; style shorter than the germen. Stigma acute.

TAB. XXIII. *Fig.* 1. Flower. *f.* 2. Portion of the perianth. *f.* 3. Pistil :—*magnified.*

XVI.—*Descriptions of Four New Species of* MOSSES, *discovered in Louisiana by the late* Mr THOMAS DRUMMOND. *By* W. WILSON, Esq.

1. Neckera *breviseta* (Hook. and Wils.), caule decumbente subpinnato, ramis attenuatis, foliis imbricatis erecto-patentiusculis ovato-acuminatis estriatis enerviis, seta brevi, capsula oblonga, operculo conico-subulato.—TAB. XXIV. A.

HAB. Prope St Louis ad fluvium Mississippi, *Drummond.*

Caulis decumbens, uncialis vel longior, ramis pinnatis, ramulisque brevibus acutis. Folia dense imbricata, suberecta, ovato-acuminata, concava, margine subreflexa, integerrima,

omnino estriata, subenervia, nempe nervo gemello brevissimo, flavicantia. Seta erecta, lævis, lineas quatuor longa. Capsula erecta, oblonga, superne angustior, ore annulato. Peristomii exterioris dentes lineari-subulati, erecti, rufescentes, interioris cilia flava. Operculum conicum, subrostratum, rostello obtuso obliquo.

From its nearest ally, *Pterogonium flavescens*, Hook. Musc. Exot. t. 155: this Moss differs in the short seta, and in the leaves which are destitute of striæ. It has considerable affinity with *Pterogonium repens*, Schwaegr. Suppl. t. 27., which is a true *Neckera.*

Tab. XXIV. A.—*Fig.* 1. Plants of *Neckera breviseta: nat. size.* *f.* 2. Fertile portion. *f.* 3—6. Leaves. *f.* 7. Transverse section of a leaf. *f.* 8. Capsule from which the operculum is removed. *f.* 9. Portion of the peristome:—*magnified.*

2. Daltonia *nervosa* (Hook. and Wils.), caule suberecto subramoso, foliis ovato-acuminatis margine reflexis nervo continuo, capsula urceolata subsessili perichætio immersa, operculo conico, calyptra dimidiata.—Tab. XXIV. B.

Hab. In arboribus prope *New Orleans*, cum *D. heteromalla* commixta, *Drummond.*

Statura *D. heteromallæ*, cui similis. Folia magis patula, siccitate erecta, nec appressa, margine evidenter subrevoluta, nervo ad apicem producto. Perichætialia longiora, lanceolata, dorso papillosa. Seta brevissima, subnulla. Capsula urceolata, basi rotundata. Peristomii exterioris dentes sedecim erecti, stricti, anguste subulati, albidi, absque linea media, interioris cilia breviora, concolora. Annulus vix ullus, obscurus, simplex, margine operculi adnatus. Calyptra latere fissa.

Obs. D. heteromalla has a distinct annulus, and a considerable border surrounds the peristome, which has the teeth inflexed at the base, and distinctly marked with a medial line. The leaves, too, in that species, are very different from those of the Moss now given.

TAB. XXIV. B.—*Fig.* 1. Plant: *nat size.* *f.* 2. Portion of the same. *f.* 3, 4, 5. Leaves. *f.* 6. Capsule and perichætium. *f.* 7. Capsule and single perichætial leaf. *f.* 8. Capsule with operculum. *f.* 9. Calyptra (*nat. size*, and *magnified.*) *f.* 10. Section of the operculum, with a portion of the annulus. *f.* 11. Peristome. *f.* 12. Portion of do. *f.* 13. Sporules:—*magnified.*

CLASMATODON (Hook. and Wils.)

GEN. CHAR.—*Peristomium* duplex. *Exterius* dentibus sedecim brevibus bipartibilibus bifidisve. *Interius*, membrana laciniis bifidis vel geminatis totidem iis subopposititis irregularibus divisa. Calyptra cuculliformis.

3. Clasmatodon *pusillus* (Hook. et Wils.), caule procumbente vage ramoso, foliis patentibus ovatis acutis seminervibus, capsula elliptica erectiuscula, operculo conico rostrato. TAB. XXV. A.

HAB. In arboribus prope New Orleans, *Drummond.*

Similis *Pterogonio decumbenti*, Schwaegr. Suppl.; at rami non pinnatim dispositi. Caulis semiuncialis, rami ascendentes. Folia laxe imbricata, patentia, siccitate cauli appressa, late ovata, acuminulata, integerrima, concaviuscula, nervo mediotenus instructa. Perichætialia ovato-lanceolata. Seta lævis, lineas tres vel quatuor longa. Capsula erectiuscula, oblongo-elliptica, ore annulo obscuro nec facile solubili cincto. Peristomii exterioris dentes valde obscuri, plerumque brevissimi, irregulares, aliquantulum torulosi, quandoque bifidi, rufescentes, interioris laciniæ fulvæ plerumque ad basin bifidæ, cruribus inæqualibus. Operculum e basi convexa oblique brevi-rostratum. Calyptra dimidiata, glabra.

This Moss has been sent by Schweinitz from America, named *Pterogonium repens.* In size and general appearance it much resembles *Pterogon. subcapillatum.* The outer peristome is not easily detected, but it is undoubtedly present.

TAB. XXV. A.—*Fig.* 1. Plant of Clasmatodon pusillus: *nat. size.* *f.* 2. The same. *f.* 3. Portion of the same. *f.* 4, 5,

6. Leaves. *f.* 7. Capsule with the calyptra. *f.* 8. Capsule with operculum. *f.* 9. Peristome. *f.* 10. Portion of do., and sporules:—*magnified.*

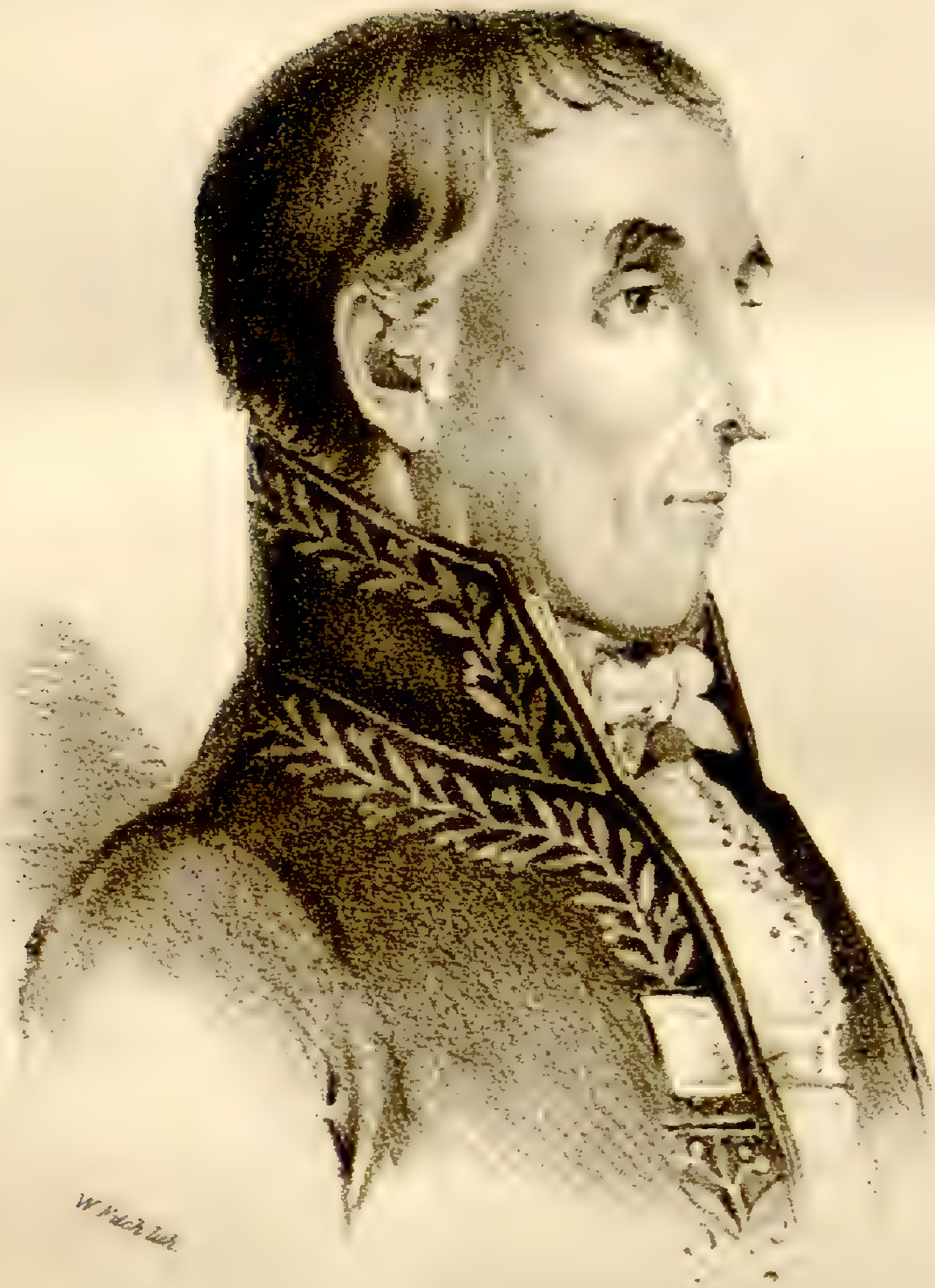
4. Grimmia *Drummondii* (Hook. et Wils.), caule subsimplici, foliis patulis lineari-lanceolatis acutis subcarinatis siccitate crispatis, capsula elliptica exannulata, operculo rostrato, calyptra sulcata, peristomio immerso.—TAB. XXV. B.

HAB. In Louisiana, arborum truncis, *Drummond.*

Caules subsemiunciales, erecti, aggregati. Folia patulo-reflexa, lineari-lanceolata, acuminulata, integerrima, canaliculata, crassiuscula, nervo subcontinuo, siccitate valde crispata, absque nitore. Seta brevis, foliis triplo longior. Capsula erecta, oblongo-elliptica, ore rubro. Peristomii dentes ore capsulæ subimmersi, conniventes, late subulati, subinde perforati, apice vix fissi, externa facie trabeculati, saturate fulvi, basin versus rubri. Calyptra campanulata, flavo-brunnea, sulcata, basi lacera, capsula brevior illamque amplectens. Operculum e basi convexa rostratum, rectum, capsula paulo brevius.

The absence of an annulus in this species, the immersed peristome, and the more crisped dry foliage are marks whereby this Moss may be readily distinguished from *G. crispata* and *G. Muhlenbergii.* In size it is intermediate.

TAB. XXV. B.—*Fig.* 1. Plants: *nat. size.* *f.* 2. Do. *magnified.* *f.* 3. Capsule with calyptra. *f.* 4. Leaf magnified. *f.* 5. Apex of leaf more highly magnified. *f.* 6. Section of leaf, do. *f.* 7. Portion of the peristome, do.



W Nitch lith.

Richard

XVII.—*Memoir of* LOUIS-CLAUDE-MARIE RICHARD.*

(With a Portrait, from an original drawing in the possession of the Editor.)

L. C. M. RICHARD was born at Versailles on the 4th of September, 1754. His father, Claude Richard, the King's gardener at Auteuil, was a man of much information, not only in what referred to his own profession, but also in the science of Mathematics; and it was his office to supply, in case of sickness, the place of the Professor who gave Mathematical instructions to the Pages of his Majesty. The king, Louis XV., who frequently saw him when he visited the gardens, was struck with his shrewdness and extreme simplicity of manners, and having frequently taken occasion to converse with him on different subjects, he finally honoured him with much of his confidence.

Claude Richard had sixteen children, and as with all his economy he could not expect to leave them any fortune, he earnestly desired to give them, at least, a good education.

Louis, the subject of our memoir, the eldest, was placed at the college of Vernon, where he distinguished himself by his aptness and zeal for general information, and made uncommonly rapid progress, devoting his hours of recreation to drawing and making plans, without any idea how valuable a resource he would here find.

The brother of the father, Claude Richard, had the superintendence of the Royal Garden at Trianon, where were then collected all the rarest and most beautiful vegetable productions of both hemispheres, and in which the young Richard, when visiting his uncle, acquired a taste for botany: whole days would he pass in examining and describing plants, and in forming a little Herbarium, and when only eleven years of age, this taste had grown into a passion.

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* Selected from the "Notice sur Louis-Claude-Marie Richard, Membre de l' Institut, Professeur à la Faculté de Médicine de Paris, Membre de la Legion d' Honneur, etc. etc., par M. Charles Kunth."

The perusal of books of travels excited his imagination, and from that time may be dated the resolution which he adopted of addicting himself entirely to Natural History, exploring the most distant and least known lands, and there making discoveries.

When Louis Richard was thirteen years of age, and had finished his first classes, and was about to commence the study of Rhetoric, the Archbishop of Paris, who had remarked the precocity of his talents, promised the elder Richard his especial patronage, if he would destine his son to the ecclesiastical profession. As may be easily imagined, this flattering proposal was eagerly accepted by the family; but so distasteful did it prove to our youthful naturalist, that he resisted every solicitation, and finding his parent inflexible and deaf to his entreaties, he finally, in utter despair, fled from the parental roof, and escaped alone to Paris. Reprehensible as this step certainly was, some excuse may be found in the extreme youth of the child, and it also evinced such a vehement attachment to his studies, that his father would no longer oppose it, but trusted to time and experience to work a change. This, however, did not ensue: his taste became daily more confirmed, and the result proved far happier than could possibly have been foreseen. Let our readers imagine the state of a lad of thirteen, utterly inexperienced and alone in Paris, exposed to every danger and seduction, and whose only subsistence depended on the slender sums that he had contrived to save, and an allowance of twelve francs (ten shillings) a month, which his father had agreed to grant him for a short period. His destitute condition may be easily conceived. The parent entertained hopes that want would drive his son home, but nothing on earth could wear out the patience, or change the resolution, of the young Richard, who felt that the happiness of his future life depended on his present firmness. Amid the severest privations, he industriously pursued his studies, and went through the course of Philosophy and Logic in the Mazarin College. Meanwhile, the funds for a necessary subsistence were indispensable, and here his talent for drawing became useful; for, by much assiduity and persevering efforts, he threw himself in the way of some architects, who allowed him to copy some of their plans, and as he performed the work intrusted to him with diligence and ability, he was quickly employed again in the same way, and obtained sufficient money to supply all his wants. Thus he was enabled to devote himself without scruple to his favourite studies. Botany, Comparative Anatomy, Zoology and Mineralogy, alike excited his curiosity, and engrossed his attention during the greater part of the day, while the night was devoted to his more gainful pursuits, which now flowed in very quickly, and paid him exceedingly well. He soon became eager to make plans himself, instead of confining himself to copying those of others, and the fine garden of Straas at Auteuiel was executed from his designs. Still engrossed with his travelling projects, he availed himself of several concurring favourable circumstances, to obtain, by strict economy, the means of realizing them; and we have been assured, that on his departure for America, he had amassed a considerable sum.

While Louis Richard was still very young, he had presented to the *Academy of Sciences* some memoirs which had attracted the notice of Bernard de Jussieu, and this truly great botanist treated the youth with much kindness, and gave him the valuable privilege of consulting his library and his rich collections.

The subject of our young Naturalist's ardent aspirations and earliest desires was finally realized in 1781. The Academy of Sciences nominated him to Louis XVI., as the individual who should make an expedition to French Guiana and the Antilles; and this monarch, who had known him when very young, approved the choice of the Academy, and promised, not only to reimburse him when he should return, for all the expenses of his journey, but to recompense him also with a pension and a post congenial to his tastes.

Richard, who had long nursed a project for undertaking a voyage to very distant lands, had been fitting himself for it during fifteen years, by the study of drawing and by attention to every branch of Natural History, advantages in which he excelled nearly all his predecessors. He quitted France in May, 1781, and after spending several months in Cayenne, where he had landed in December, he travelled through a great part of French Guiana, Martinique, Guadeloupe, Jamaica, St Thomas', and most of the islands situated in the Mexican Gulf. Equally a Zoologist, Botanist, and Mineralogist, he described and dissected animals, analyzed and drew plants, and studied the stratification of rocks, examining all with the same interest, and daily adding to the richness of his collections. Under a burning sun, and in the most noxious atmosphere, he thought nothing of fatigue and danger; but while traversing immense deserts, bivouacking in deep forests, scaling lofty mountains, and even exploring the yet smoking crevices of volcanic craters, he was more than once on the point of falling a victim to his ardour and fearless zeal. Sometimes he was forsaken by his guides, remote from any human dwelling, and occasionally he was in peril of being plundered, and perhaps massacred by them. In these perilous circumstances his intrepidity and presence of mind proved his salvation: he knew how to sway the spirits of the poor wretches who were around him, and to keep them in awe by his own courage. He frequently went to the chase of the jaguar, and was seen to attack, without fear of being devoured by the beast, this savage creature which furiously springs on any one who but slightly wounds it.

A residence of eight years in a country where money alone can avail to procure the slightest aid from the natives, together with the indispensable outlay requisite for the preparation and carriage of his collections, having finally exhausted all the funds that he had contrived to get together, he wrote to France to ask for more; but all his requests were unanswered. The affairs that then agitated the government were of too pressing a nature to allow of a thought being given to the distant traveller; and he therefore found himself compelled to return home, which he did in the month of May, 1789.

The Revolution had already broken out, and almost all Richard's friends and protectors had vanished or lost their power and influence. The promises which had been made to him before his departure were forgotten, and the immense collections that he brought back excited no attention. A herbarium of 3000 species of plants, principally new; an immense number of cases, full of quadrupeds, birds, insects, and shells; with a valuable series of minerals and rocks, were the fruits of his expedition. Never perhaps had such a mass of materials been collected by a single individual, and in so brief a period of time; yet the man, whose generous devotion to science had procured these stores, was left unrewarded, and abandoned to privations which were the more severely felt, as the fatigues of this lengthened journey had materially impaired his health. His constitution had never been robust, and he experienced much suffering from hernia and a chronic affection in the bladder, which he had contracted during his residence in America. Thus neglected and ailing, he naturally felt a desire for affectionate domestic society, and he took a wife the year after his return, 1790; and from that time forward devoted himself to his family, and abstracted himself as much as possible from general society. The neglect with which he had been treated by his countrymen, combined with bodily malady, produced an unfavourable effect on his temper, and this was shown by his general conduct towards men of science. For many years he lived in the closest retirement, and we possess no botanical work of any importance which bears the date of this period. He, however, bestowed much attention on Zoology; his collection of shells was among the richest and most accurately named, and he always asserted that his mode of classification had influenced, in a measure, those theories which were soon afterwards broached by authors of the highest repute in this department of Natural History. About this time, too, he commenced that admirable collection of analytical drawings which he never ceased to increase until the very close of his life.

The numerous proofs of esteem which he received from the most eminent European *Sçavans*, the justice awarded to his talents, and perhaps the calming influence of age, at length restored to his mind that peace to which in his earlier years he had been a stranger, and he found no difficulty in renewing his intercourse with those who had ever deplored his departure from them, and who had constantly acknowledged his high merit. He was elected to fill the chair of Botany in the School of Medicine; some years after, he was chosen a member of the First Class in the Institute, in the Section of Zoology and Comparative Anatomy. The Royal Society of London also admitted him of the number of its corresponding members, and he was nominated a member of the Legion of Honour.

The Professorship of Botany in the School of Medicine rendering it obligatory on him to deliver an annual course of lectures on Botany, he acquitted himself most satisfactorily of this task. Not satisfied with merely defining the elements of the science and the characters of Genera, he also gave lessons of analysis, and with the different specimens in his hand, he expounded in the simplest terms their structure, and the modifications and connexion of the various organs. So valuable were these demonstrations felt to be, that botanists, already of much experience, did not scorn to rank themselves among the students of this illustrious Professor. Every Sunday Richard made herborizing excursions into the country. Surrounded with a class of 200 or 300 pupils, who eagerly pressed around him, he no sooner thought he could show them an interesting plant, than he was the first to plunge into a morass, to clear hedge and ditch, and make for himself a path through brushwood, while, forgetting his infirmities, he seemed to have regained all the vigour of early youth. It was only during the very last years of his life, and while suffering from a protracted illness, that he confided the care of his students to his son Achilles Richard, whom he had himself educated, and who, by the works he has since published, has proved himself worthy to replace his illustrious father.

Richard was a miser over his time, and disliked the disturbance of visitors. To obtain a favourable reception at his hands the stranger must show a desire for instruction. His own employment forming his greatest pleasure, he ever regretted the interruptions which his public functions entailed, and when obliged to leave his cabinet and plants on a fine sunny day, he would cry out with regret, "here is another day lost for my analysis!"

It was neither for fame nor fortune that this keen naturalist laboured so hard; he loved science for her own sake; his sole object was, to make himself thoroughly acquainted with the organization of plants, to determine their affinities, and to detect some new fact in anatomy or vegetable physiology. Notwithstanding the difficulty which he experienced in bringing up his numerous family, Richard always scornfully rejected the offers that were made him to engage in lucrative undertakings; he chose to devote his attention wholly to analysis. He could not, however, always preserve the composure which this reflective study demands; for, irritated by some attacks which were levelled at his writings, he unfortunately allowed himself to reply in a spirit of animosity which excited new censures of a most unpleasant nature. These discussions, however trying to his spirit, were followed by useful results, as they cleared up some difficult questions, and gave rise to the publication of several excellent memoirs.

In 1818, the personal sufferings, which Richard had long endured with fortitude and resignation, became more and more severe, and he was thenceforward compelled to give up any consecutive and protracted labour. An obstruction of the bowels threatened his life; but while the affectionate attentions of his family, and the skill of the physician, availed to moderate his pains, and to protract his existence, they could not restore him to health. During two years, he persevered in devoting the intervals of ease to pursuing his observations; and, but a few days before his decease, he reminded his son to water some little plants which he still hoped to dissect. It was on the 7th of June, 1821, that science lost her ardent votary, at the age of 67 years.

Though the works which Louis Richard has published are but few in number, yet he is indisputably the man, who has in his time contributed in the greatest degree to the progress of botany; and the influence which he has exercised will be eminently displayed upon the labours of those who are imbued with his principles, and follow in his track. No one ever carried farther the art of scanning nature in her minutest details: the difficulty of any particular point of research was the very reason why he chose to investigate it; the most complicated organization interested him the deepest; and he would spend whole months in patiently following out any observation, of which the elucidation promised to clear up a still obscure point. He possessed the art of design in an eminent degree; all his drawings are accompanied with the minutest details, executed with remarkable clearness and precision; for he well knew that it is solely by such analyses that any happy combinations can be formed. His writings are sometimes in a negligent style; but there is not one among them which does not contain some novel and profound observation; and the few publications which he has left behind him amply suffice to render his name illustrious. His *Analysis of the Fruit* is absolutely and entirely new, and leaves nothing to be desired. He has examined and thoroughly elucidated those most difficult Families, the *Gramineæ, Orchideæ, Hydrocharideæ,* and *Orchideæ, &c.*, and he is the man who has inspired the present generation with that partiality for strict research and close profound examination, which essentially characterizes the French School of Naturalists.

Richard left an immense number of inedited materials. As he sought for general laws, so he had studied the minutest cryptogamic plant with equal earnestness as the most complicated organization, and many of the most important discoveries made for fifty years may be seen in his manuscripts.

The true structure of the Mosses was detected by him prior to Hedwig, though he did not attribute the same functions to their organs.

Although the Institute, anxious to secure Richard to itself, had nominated him to a vacant place in the Zoological Section, it had never been suspected that the man who had laboured so hard at botany should have found time to become thoroughly master of any other part of Natural History. People in general were not aware that, during his residence in America, he had collected a great mass of valuable materials in Zoology, Comparative Anatomy, and Mineralogy. It was only when examining his manuscripts, his drawings, and the preparations which he kept in his cabinet, that any estimate could be formed of the extent and variety of his acquirements; and then it was universally acknowledged, that the age had produced few individuals which could bear any comparison with him.

The works which we possess from the pen of Richard are the following:—

I. *Elementary Dictionary of Botany*, by Bulliard, revised and almost wholly recomposed. (Amsterdam, 1800.) Besides many interesting dissertations, as those on the *Berry, Bulb, Vernation, Arillus, &c.*, parts of the vegetable of which Richard first explained the real nature and important functions; this work is valuable on account of twelve plates representing all the modifications of the different organs of a plant; and it also contains the completest and most philosophical catalogue of the technical terms.

II. *Commentatio de Convallaria Japonica*, L., *novum genus constituente* (Nouv. Journ. de Bot. tom ii., p. 1. 1807.

III. *Mémoire sur les Hydrocharidées*, (Mém. de l'Instit. 1811. p. 1.)

IV. *Demonstrations Botaniques, ou Analyse du Fruit, considéré en general, par Richard*, (publiées par Duval, 1808.)

This is a work, which, by reason of its great conciseness, the difficulty of the subject it treats, and the mass of accumulated observations contained in it, requires several attentive perusals, even from those individuals who are versed in the study of vegetables; but these pains are well rewarded by the correct theories, precise definitions, and philosophical views which this author has here first brought to bear on that most difficult portion of botany, the structure of the fruit; and the work of Gærtner would be far more perfect had its writer possessed the advantage of being acquainted with the publication of Richard.

There are two translations of the *Analysis of the Fruit:* one in German, by M. Voigt, with the notes of Richard, (Leipzig, 1811.), and the other in English, by Mr Lindley, (London, 1819.)

V. *Analyse Botanique des Embryons endorhizes, ou Monocotyledones, et particulièrement de celui des Graminées.* (Ann. du Mus. tom. xvii. p. 223—442, 1811.)

This memoir, which is of the highest importance to carpology, contains a great number of descriptions and admirably executed designs, which elucidate the structure of *the Embryo in the Grasses,* and he also adopts a new set of terms for the different parts.

VI. *Examen critique de quelques mémoires anatomico-physiologico-botaniques de M. Mirbel,* (Journ. de Phys.)

VII. *Proposition d'une nouvelle famille de Plantes, les Butomées,* (Mém. du Mus. t. i. p. 364.)

VIII. *Annotationes de Orchideis Europæis,* (ibid. t. 4. p. 23.)

IX. *Mémoire sur la nouvelle famille des Calycéreés,* (ibid. t. vi. p. 28.)

X. *Mémoire sur la nouvelle famille des Balanophorées, terminé et publié par M. Achille Richard,* (ibid. t. viii. p. 404.)

XI. *Mémoire sur les familles des Coniferés et des Cycadées.* A manuscript work, accompanied by analytical figures, the most perfect which we ever possessed.

XII. Richard is the anonymous author of the *Flora Boreali-Americana* of Michaux, in 2 vols. 1803.

XIII. Conjointly with M. de Jussieu, he published several Memoirs on new Families, *Lorantheæ*, *Gesnerieæ*, *Lobeliaceæ*, (Ann. du Mus.), &c.

XIV. *Catalogue des Plantes de Cayenne, envoyées par Leblond*, in which Richard has defined a great number of new species, (Act. de la Soc. d' Hist. Nat. de Paris.)

XV. *Mémoire sur le Lygeum Spartum*, (ibid.)

XVI. *Extrait d'une instruction pour les Voyageurs Naturalistes*, (ibid.) Here Richard investigates and determines which are the different organs in animals which afford the best characters, and which it therefore most behoves the travelling naturalist to study.

END OF VOL. IV.

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ERRATUM.

It is by mistake that I had understood the *Laurus* figured at Tab. xxiii., and described at page 418 of this volume, was a native of Southern Africa. It is a native of *Moreton Bay*, Australia; and, as it bears the manuscript name of *L. australis*, All. Cunningham, by whom it was discovered and sent to Kew, that is the name it must continue to have.

END OF VOLUME IV.